REPORT RESUMES

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THE EFFECTS OF ORIENTATION TO TESTING ON MOTIVATION FOR AND OUTCOMES OF TEST INTERPRETATION.
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A STUDY WAS UNDERTAKEN TO INVESTIGATE THE EFFECTS OF PRETESTING ORIENTATION UPON (1) STUDENTS' MOTIVATION FOR LEARNING TEST RESULTS AND (2) THE CHANGES IN ACCURACY OF SELF-ESTIMATES RESULTING FROM TEST INTERPRETATION. FIVE SCHOOL SYSTEMS WERE SELECTED FOR PARTICIPATION IN THE STUDY. TWO RECEIVED THE ORIENTATION TREATMENT, TWO THE ROUTINE TREATMENT, AND ONE WAS USED TO STUDY THE EFFECTS OF COMMUNICATION UPON TESTING. THE SUBJECTS WERE FROM GRADES 5, 7, 9, AND 11. PRETESTING ORIENTATION CONSISTED OF PRESENTING STUDENTS WITH A PREPARED STATEMENT ABOUT TESTING, THE KINDS OF TESTS THEY WOULD TAKE, WHAT USES COULD BE MADE OF TESTS, AND WHAT STUDENTS COULD LEARN ABOUT THEMSELVES FROM THE TESTS. FOLLOWING ORIENTATION, BOTH TREATMENT GROUPS COMPLETED A SELF-RATING INSTRUMENT, TOOK THE TEST BATTERY, AND COMPLETED THE SELF-RATING DEVICE A SECOND TIME. STUDENTS WERE GIVEN AN OPPORTUNITY TO REQUEST TEST INTERPRETATION INTERVIEWS WITH COUNSELORS. TESTS WERE FIRST INTERPRETED TO STUDENTS REQUESTING INTERVIEWS AND LAST TO THOSE NOT REQUESTING INTERVIEWS. THE SELF-RATING DEVICE WAS COMPLETED A THIRD TIME FOLLOWING THE COUNSELOR INTERVIEW. THE DATA TENTATIVELY INDICATED A RELATIONSHIP BETWEEN ORIENTATION AND MOTIVATION FOR TEST INTERPRETATION. SIGNIFICANT INCREASES IN ACCURACY OF SELF-ESTIMATES OCCURRED FOLLOWING TEST INTERPRETATION. IN LIGHT OF THE FINDINGS, RECOMMENDATIONS WERE MADE CONCERNING--(1) IMPROVED GUIDANCE PRACTICE, (2) FUTURE RESEARCH IN THE AREA OF TEST INTERPRETATION, AND (3) EXPLORATORY ANALYSIS OF THE DATA GATHERED DURING THE PRESENT STUDY. (JC)

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THE EFFECTS OF ORIENTATION TO TESTING ON MOTIVATION FOR AND OUTCOMES OF TEST INTERPRETATION

Cooperative Research Project No. 1344

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CHAPTER I

Introduction

Following World War I, the testing movement has grown, unimpeded, and its effects have touched virtually all facets of American life. One of the most significant of these has been the effects of widespread reliance on test results in the public schools for diagnosing learning difficulties and personality problems, grouping students according to academic ability, and for counseling students regarding educational and vocational decisions. The National Defense Education Act of 1958 gave added impetus to already pyramiding testing programs in the nation's public schools. In addition to the uses of tests just mentioned, one of the major uses has been that of contributing to increased self-understanding among students. In spite of this emphasis, comparatively little attention has been given to devising methods and techniques for making test information available to students in a manner which would enable them to integrate test information into their self-concepts. This lack of attention is specially noteworthy considering the amounts of time and money currently being expended for such services (Adamek, 1961). Instead, the major emphasis has been placed upon presenting students with an accurate appraisal of tested abilities, interests, and personality characteristics without serious consideration of their reactions to or uses of such information. This and related trends have led Rogers (1948) to assert that clinical work today is removing the bases for evaluation from the individual and placing them in the hands of the experts. Rogers views this trend with much concern, since it is based, he believes, on the assumption that the individual lacks the ability and resources for self-evaluation.

Most of the research studies on test administration have been directed toward defining those factors which influence the students' actual performances on tests. No known research has investigated the effects of test orientation upon students' motivation for learning about themselves through an interpretation of their test results or its effects upon their ability to modify self-perceptions. Some has been written about the importance of client involvement in the selection of tests (Bordin and Bixler, 1946) and in preparation for test-taking on an individual basis in clinical and vocational counseling settings, but rarely does one find this approach applied to group testing procedures in public schools.

The literature in clinical psychology and educational testing is replete with studies on the effects of administration and examiner influence on the clients' responses. This has been a fruitful area of research, but the studies have been concerned with factors influencing test scores rather than the client's use of test scores. These studies do point out that the conditions under which tests are administered are important variables to note when considering a student's test performance. However, the effects of motivation for learning about one's self upon the ability to accept and use test results have not been systematically investigated.

The Problem

This study investigates the effects of orientation to testing in small groups upon (1) motivation of students for learning about themselves through the interpretation of test results and (2) students' ability to form more accurate self-perceptions following test interpretation.

The investigators believe that spending some time prior to actual test administration with students in discussing testing with them, e.g., its purposes, what kinds of tests they will encounter, and what they can gain from test information, will result in increased motivation to learn about themselves through test interpretation as evidenced by more willingness to have results interpreted and that they will gain more from the interpretation as evidenced by increased accuracy in self-estimates following test interpretation.

Workers in clinical and diagnostic testing have long recognized the importance of establishing optimal rapport with clients in order to elicit responses which are representative of the clients present or potential level of functioning, as well as building a relationship subsequently conducive to psychotherapy. For nearly two decades workers such as Bordin (1955), Bordin and Bixler (1946), and Rogers (1946) have consistently advocated involving individual clients in the test selection and interpretation processes. It is not without sound theoretical and empirical bases that they do so. Current evidence is fairly conclusive that without involvement in these processes there is only slight chance for change in self-perceptions resulting from knowledge of one's test results. Though the actual research will be reviewed in detail later, most of the studies have shown only slightly increased congruence between test- and self-estimates.

Berdie's statement (1954) concerning the distinction between "learning and accepting" information about one's self seems relevant here. "Learning information refers to gaining the ability to reproduce it verbally, while accepting it involves the integration of the learned behaviors into the total pattern of behavior." His contention is that the self-rating device used as a criterion elicits a form of verbal learning but does not reveal the degree of integration of such learning into the pattern of individual behavior. While he has identified one of the major limitations inherent in the use of such criterion measures, the available research fails to indicate that attempts at conveying test information have significantly changed behaviors, even at the level of "learning."

Certainly it is more desirable to have individuals integrate information about themselves as a result of test interpretation, but it seems that "learning" can be regarded as a precondition for "accepting" information about self.

Duncan (1961) studied the effects of group orientation upon outcomes of vocational counseling. Using two groups of male freshmen who had requested vocational counseling interviews, she provided one with group orientation concerning aims and procedures of the counseling center, roles of client and counselor, the general meaning and use of tests, the nature of vocational counseling, and the role of personal and occupational information in vocational counseling. Members of both groups then participated in individual counseling interviews. While Duncan found, as predicted, that group orientation could be used within the counseling center situation and that it enabled a counselor to reach more students without a significant reduction in time spent individually with them, she also found that individual interviews preceeded by group orientation were no more effective than individual interviews alone in: (a) reducing discrepancies between self- and test-ratings, (b) increasing students' confidence in self-estimates of personality, ability, and interests, (c) eliciting realistic statements of vocational goals, and (d) providing more information regarding vocational goals. Contrary to prediction, group orientation failed to reduce the attrition rate. Clients in the orientation group spent an average of 4.9 hours with a counselor whereas members of the control group spent an average of only 3.3 hours.

No known research has systematically applied the principle of either client-involvement or orientation to group testing situations in the public schools. If this approach is a useful one in terms of creating individual motivation and readiness for integrating information, it follows that it could be profitably utilized in the testing programs in our public schools.

Should this technique prove applicable to group testing in public school situations, it would result in increased readiness to incorporate knowledge about self into the rapidly stabilizing self-concepts of elementary and secondary school students. It would increase their readiness to further explore their doubts, fears, and aspirations through counseling with the trained workers whose numbers are insufficient but steadily increasing in our schools. Perhaps most important, it would represent one small step in the direction of helping individuals acquire and integrate the kinds of information which they can use in making intelligent judgments and decisions throughout their lives.

Definition of Terms

Several terms are used in this study which have various possible meanings. In order to communicate more effectively, it is necessary to define these terms as they are used in this study.

Counselor--In this study, individuals who interpret test results to students will be designated as counselors. The minimum professional training of counselors who participated in this study included supervised practice in counseling as well as intensive training by the investigators in order that competence and standardization in test interpretation would be insured.

Affect--As used in this study, affect refers to verbal or non-verbal manifestations by a student of fear, disappointment, happiness, surprise, dismay, disbelief, joy, sadness, or other feelings in response to learning his test results.

Group Testing--Group testing refers to the administration of standardized test batteries by competent testers. Individuals who administered tests in this investigation were required to have had experience in public schools as well as being sufficiently familiar with the standardized instructions for administering the test battery. The test battery administered in this study included measures of achievement, intelligence, and interests. Tests were administered according to the directions provided in the publisher's manuals.

Modification of self-perceptions--In this study, modification of self-perceptions refers to reliable changes in self-estimates made on a self-report instrument measuring students' perceptions of selected measures of interest, achievement, and intelligence.

Orientation group--The Orientation group is that half of the sample which met as a class to discuss what tests are, what students can learn from tests, and how information from tests can be useful to them.

Self-perceptions--In this study self-perceptions refer to self-estimates of interest, achievement, and intelligence.

Motivation--In this study, motivation refers to students' responses when given the opportunity to volunteer for test interpretation. Students were rated highest in motivation who requested test interpretations, and lowest who responded that they did not wish to participate in test interpretation.

Hypotheses

The primary objectives of this study are to investigate the effects of orientation to testing upon students' motivation for learning about themselves through test interpretation and the effectiveness of test interpretation. Two major hypotheses were formulated: (1) Students who participate in the orientation procedures prior to test administration will show significantly greater motivation for learning about themselves through participation in test interpretation interviews than those who have not participated in orientation. (2) Students who participate in the orientation procedures prior to test administration will show significantly greater gains in accuracy of self-perception than those who did not participate in the orientation prior to testing.

Experimental Design for the Study

1. Selection and definition of the Orientation and Routine groups.
2. Administration of Orientation treatment to one group.
3. First administration of the self-rating scale to both groups.
4. Administration of the test battery to both groups.
5. Second administration of the self-rating scale to both groups.
6. Administration of Counseling Request Form.
7. Test interpretation interviews for students in both groups.
8. Third administration of the self-rating scale to both groups.
9. Fourth administration of the self-rating scale to both groups after a two-month period.

Further explanations of procedures will be presented in Chapter III.

Limitations of the Study

This and similar studies have been based upon the assumption that it is helpful for students to learn their test results. This implied that the most useful information regarding abilities and interests comes from an expert interpretation of standardized test results. While it seems likely that reality-testing can be facilitated in this manner, two other points merit consideration. First, there may be other experiences such as taking and discussing teacher-made tests, classroom discussions of such performances, or competitive experiences in the classroom which provide students with opportunities to compare themselves with others. While the frame of reference for such experiences is quite limited, it might be argued that many such experiences, while not "reliable" or "standardized," contribute as much to self-understanding of abilities and interests as do half-hour sessions of test interpretation by trained persons. Second, it should be noted that the reliability of common tests, while generally satisfactory for use with groups, is not high from the standpoint of use with individuals. Furthermore, high intercorrelations among subtests render questionable the practice of using common achievement and ability tests for interpretation by separate subtests.

This study is limited in that the sole criterion of effectiveness of test interpretation is self-report data. Without discussing the issue of whether self-report is admissible as scientific data, it is evident that test interpretation, or any form of counseling, should ultimately result in behavioral changes which can be observed independent of the individual's frame of reference. This is not an argument against the phenomenological emphasis on "looking at the world through the eyes of the individual." The point is, however, that since successful test interpretation should supposedly help individuals to more effectively utilize their available personal and intellectual resources, this improved utilization should be evidenced in such independently observable behaviors as improved school grades, more adaptive classroom behavior, improved personal and vocational adjustment, more realistic vocational choices, etc. The bulk of research in this area of test interpretation has not examined these and other factors as useful criteria of test interpretation effectiveness. This is understandable, considering the cost, time, and increased practical and methodological difficulties inherent in such studies, but such investigations should be considered in view of the annual expenditures of time and money for test interpretations in the public schools.

In view of Berdie's (1954) distinction between learning and accepting test information, a serious limitation of the research reviewed, as well as of this investigation, must be given careful consideration. Most of the research designed to investigate the effectiveness of test interpretation has asked students to describe their interests, achievement, etc. on a self-report device shortly after the test interpretation interview. When this rating is used as the sole criterion of increased accuracy of self-perception, it is impossible to determine how much the changes in rating reflect real acceptance and integration of test information and how much they reflect immediate recall of the information presented to the student by the counselor a few minutes earlier. Since true acceptance of the information implies changes in the behavior patterns, follow-up administrations of self-rating devices also fail to adequately answer this question. We seem to be faced with a methodological dilemma: some students may, upon a follow-up administration of a self-report device, remember their test scores but have made no other, more basic, changes in behavior patterns; however, others could have "forgotten" their test results so that they are unable to show increased agreement between self-estimates and test-estimates but have sufficiently integrated the meanings associated with the test interpretation so that they have made significant changes in their behavior patterns.

The present research employs only the criterion of increased congruency between self-estimates and test-estimates. The limitations discussed are acknowledged. This measure of test interpretation effectiveness was used in order to gain some evidence relating to the variables of orientation and motivation for test interpretation as related to changes in student self-ratings. Any positive findings which may result from this study cannot, in view of the above discussion, be unequivocally regarded as evidence of increased acceptance of information about self. Should self-ratings following test interpretation be more accurate, one would have to conclude: first, that a significant amount of learning had occurred and, second, that increased self-acceptance may have occurred to an undetermined extent.

Summary

This chapter directed attention toward the lack of research designed to improve the effectiveness of test interpretations provided for individual students. It was noted that, in spite of the emphasis placed upon the use of standardized test results to improve the accuracy of students' self-perceptions, comparatively little research has been specifically directed toward helping individuals understand themselves more fully through knowledge of test results.

Research investigating this problem has been criticized for failing to consider students' motivation for learning about themselves through test interpretations. Furthermore, it was noted that client involvement and participation in test selection seem to be significantly related to increased self-understanding following test interpretation. Unfortunately, this approach has not been applied to group testing in public schools.

In view of these considerations, this study will attempt to study the effects of pre-testing orientation upon (a) students' motivation for learning about themselves through test interpretation, and (b) students' ability to improve the accuracy with which they estimate their achievement, intelligence, and interests.

Limitations of this and similar studies were noted: exclusive reliance on self-report data as the criterion of increased test interpretation effectiveness, failure to differentiate between acceptance and recall of test information, and extreme emphasis on interpretation of standardized test results as a means of increasing students' understanding of abilities and interests.

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON 25, D. C.

Project Description

Effects of Oreintation in Testing on Motivation for and Outcome of Test Interpretation

Problem.--This study investigates the effects of orientation to testing upon (1) motivation of pupils for learning about themselves through the interpretations of test results, and (2) the effectiveness of test interpretation.

Objectives.--The objectives are to determine to what extent those students who participate in the orientation totesting procedures prior to actual test administration show a greater motivation for learning about themselves than those who receive no orientation; (2) those students who participate in the orientation to testing procedures prior to actual test administration show greater gains in self-understanding following test interpretation than those who receive no orientation; and (3) those who are motivated to learn about themselves through test interpretation show greater gains in self-understanding following test interpretation than those who are not motivated to have their tests interpreted.

Procedures.--At least 200 students in each of grades 5, 7, 9, and 11 will serve as a sample for this study. Classes will be selected at random from a number of schools to serve as experimental and control groups. The experimental groups will participate in discussions of the tests in an attempt to determine and answer the questions pupils have about taking tests and learning from test results. From this point, both groups will receive the same treatment. A self-rating form will be administered and students will be asked to check on a five-point scale how accurate they believe this first self-rating to be. A battery of intelligence, interest, and achievement tests will be administered. The self-rating form will be administered for the second time immediately following the test administration. Students will be asked at this point whether (1) they wish to volunteer to have their tests interpreted, (2) they wish to think about it for a week, or (3) they do not wish to have their tests interpreted. After the students have indicated their preference, an attempt will be made to interpret the tests to all of the students. The self-rating scale will be completed a third time immediately following the test interpretations and again about three months after the interpretations.

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Project No. 1344
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CHAPTER II

Survey of the Literature

The major portion of research on the effects of test interpretation has been concerned with the use of different methods and techniques, i.e., aspects of the counseling process itself. During recent years a number of studies have been completed which used some self-estimating or self-rating device as a criterion for appraising change in self-concept relating to the systematic interpretation of clients' test results. The survey of literature presented here is confined primarily to those studies which: (a) were directed toward investigating the changes in subjects' self-perceptions due to effects of test interpretation, (b) utilized self-ratings as a criterion, (c) involved trained counselors in the test interpretation process, and (d) utilized psychological test results as the primary source of information given to the students.

Extensive use has been made of self-rating devices as means of evaluating outcomes of test interpretation. While described as differing in various ways, all of these devices seem to require the same task, namely rating oneself on some scale similar to that on which test results are presented to one.

> The self-rating device provides a sort of shifting intermediate criterion in the measurement of changes in self-perception when various procedures are introduced for the purpose of introducing revision in self-perception, the ultimate criterion residing in test scores obtained under standard conditions and assumed to be 'true measures' (Adamek, 1961).

One of the major limitations of the use of the self-rating as a criterion has been stated by Berdie (1954), who stressed the distinction between "learning" and "accepting," suggesting that learning refers to ability to reproduce verbally, while accepting refers to changes in the total pattern of behavior. In spite of this limitation, he does believe that changes in self-ratings provide a useful means of measuring counseling outcomes. Travers (1949) looks upon counseling as essentially a learning situation and feels that since both counseling and teaching attempt to facilitate learning, there is little difference in this respect from other learning situations. He stated:

> Much could be done to appraise both changes in the life goals of the individual and in the understanding which the individual has of his own abilities. Counselees could be asked to rate themselves on various characteristics both before and after counseling. If test scores are discussed during the counseling interview, it should be possible to determine whether this procedure develops understanding in the individual of his own strengths and weaknesses.

Berdie (1954) investigated the use of self-ratings to evaluate counseling. An experimental group of 61 and a control group of 57 college males were given a pre- and post-self-rating form and a test battery including the Strong Vocational Interest Blank, Minnesota Multiphasic Personality Inventory, Cooperative Reading Test, Cooperative English Test, and the American Council on Education Psychological Examination. The treatment group was counseled with no emphasis on test scores while the control group received no counseling. After a six-month follow-up he found the counseled group of college men were unable to estimate their measured personality characteristics and aptitude scores more accurately than those who received no counseling, but they were better able to estimate their vocational interest scores and to predict their college achievement following counseling. Berdie's conclusion was that agreement between self-rating and objective measurements is influenced by counseling, but that caution should be exercised in using self-ratings as a criterion for counseling effectiveness. Since Berdie did not stress the meaning of students' test scores in the counseling involved in this study, no conclusion can be drawn from it regarding the effectiveness of self-rating as a criterion of acceptance of test results; however, his cautions seem well worth noting.

Johnson (1953) studied voluntary male guidance center clients and found that vocational counseling increased accuracy and certainty of self-knowledge as measured by a self-rating device. Those gains remained stable after a one-month follow-up. Gains in self-understanding were greatest with respect to intelligence, followed by those with respect to interest and personality, respectively.

Dressel and Matteson (1950) used a self-rating device in testing the hypothesis that clients who participated more actively in the test interpretation would show greater gains in self-understanding, would be more satisfied with the counseling experience than those who participated less. Their results tended to confirm their hypothesis.

Lane (1952) compared "traditional" and "permissive" techniques of interpreting test results to clients. Using 111 high school juniors and seniors, Lane interpreted tests in period-length interviews, alternating experimental approaches. After one week a multiple choice checklist and an essay question, both designed to measure memory of test scores, were answered by members of both groups. This was repeated three weeks later, yielding a retest correlation of .764. Twenty interviews were recorded and submitted to five judges who were asked to state which of the two experimental treatments had been employed in each interview. Judges performed this task with 99% accuracy.

It was found that both groups made almost identical scores on the criterion measure. Since the criterion measures were restricted to recall of information, it was not possible to compare the two methods on the extent to which they elicited acceptance of the information. Lane states:

> The choice between these two techniques is not important. It is suggested that any differences in effect which may exist between the two methods would be likely to reveal themselves only in a situation in which test interpretation was made a part of a larger pattern of counseling differences.

In a similar study, L. B. Rogers (1954) used the self-rating method to determine whether a "self-evaluative" approach was more effective in test interpretation than a "test-centered" method. Students showed gains in self-understanding following both types of counseling, leading Rogers to conclude that one type of counseling did not contribute more to self-understanding in his study than did the other.

Gustad (1955) used a self-rating device to study the effects of four different methods of test interpretation and three different methods of test selection on learning during the interview. Fifty-nine male undergraduate college students who had applied for counseling completed a pre- and post-interview rating form. Gustad concluded that differing methods of test selection and test interpretation had no differential effects on gains in self-understanding. Adamek (1961), however, has criticized the methodology of Gustad's study on the grounds that it used a three-by-four analysis of variance matrix with twelve cells and only fifty-nine subjects, thus seriously restricting the amount of variation possible.

Lallas (1956) used a self-rating device to investigate three different methods of test interpretation: individual counseling interview, group interpretation, and group interpretation plus individual counseling interview. He found that the students in all three settings were superior to the control group in estimating their ability. Lallas concluded that the most effective methods of interpretation were the individual interview and the group interpretation followed by the interview. His major conclusion was that counseling in some form does improve a person's ability to make self-estimates which can be measured by a self-rating scale.

Holmes (1961) compared the effectiveness of four techniques of presenting test information to college freshmen. Scores from intelligence, interest, reading, teacher attitude, and personality tests were presented to 154 entering college freshmen. Each of five groups received their test interpretation through one of the following methods: (1) The counselor described each test and pointed out the students' standing on their profiles. The counselor answered questions, gave suggestions and reactions to students' performances. (2) The counselor encouraged client participation by asking each student to estimate his performance on a test profile before the actual results were presented to him and by allowing the client to choose the order of the tests to be interpreted. The counselor maintained a non-evaluative attitude toward the students' performances but focused on the affect expressed regarding the test results and self-rating. (3) The counselor selected the order in which the tests were interpreted, and he indicated the students' results. Student participation was encouraged by exploring, clarifying, and reflecting students' feelings and attitudes toward the test results. The counselor was non-evaluative toward the test scores and the students' feelings regarding their standings. (4) Students were mailed a brief summary of the meaning of each test and a test profile on which the scores were plotted. The author concluded that all four methods were effective, but that students who received their results by mail considered them less valuable. The method used by a counselor had less influence on student attitudes toward the counselor than the personality of the counselor himself. Students assigned to each method tended to recall scores that were higher than original estimates. Students rated themselves lower just prior to learning their actual results than when they made their first self-estimate. Those students who received results through the mail more frequently recalled their scores. This is misleading, however, since those students were mailed their results and many of them probably had them on hand when they did the second self-rating. There was no evidence that the use of the test profile in the test interpretation process either increased or decreased the students' use and understanding of the information received. It was concluded that the test interpretation process appeared useful to students in all four methods of test interpretation in helping them to understand themselves, their vocational choices, interests, strengths and weaknesses.

Singer and Stefflre (1954) criticized the use of correlational approaches alone or mere tests of significance between means in these and similar studies, suggesting that investigators who used self-rating techniques should test the direction of discrepancies between actual scores and self-ratings from pre-counseling ratings to post-counseling estimates, as well as the mere size of these discrepancies. In studying the interests of high school students, Singer and Stefflre (1954) obtained ratings of estimated interests prior to testing and counseling and three months following test interpretation. Hypotheses regarding decreases in the size of discrepancies after interviewing were tested by "t" tests between means and standard deviations. Some significant differences were found, indicating less discrepancy between actual and estimated interest scores following counseling. Some sex differences also were noted. These results may provide some clue as to why some of the other studies have indicated changes in the direction of increase in accuracy of self-perception whereas others have failed to do so. Adamek (1961) has pointed out that "changes in degree of variability could produce results indicating differences between means...due not to actual behavioral changes in the subjects but to decreased variability among the sample groups."

Adamek (1961) compared the changes in self-perceptions of interests, abilities, and problem areas under two conditions: (a) when tests were interpreted by a qualified counselor and (b) when the students received their test interpretations from self-interpreting profiles. His instrument was designed with a five-point scale on which the students rated themselves with respect to every characteristic measured in the test battery. The test battery included the Chicago Primary Mental Abilities, the Kuder Preference Record, Vocational, and the S. R. A. Youth Inventory, Form A. Adamek concluded that

> (a) there were no systematic differential effects by which one type of test interpretation could be concluded to be superior to the other, (b) testing had no differential effects on accuracy of self-perceptions, (c) testing did not induce greater accuracy of self-perceptions, and (d) the use of self-interpreting materials did not elicit more accurate self-perceptions.

O'Hara and Tiedeman (1959) investigated the relationship between subjects' estimates of their present status with respect to aptitudes, interests, social class, and their assessed standing in each of these categories as revealed by tests or stated preferences. The subjects were boys in a Catholic day school. Except for the area of social class, consistent increases in congruency between self- and test-estimates occurred between grades nine and twelve. The following correlations were reported: for aptitudes from .44 in grade nine to .69 in grade twelve; for interests from .70 in grade nine to .83 in grade twelve; for general values from .56 in grade nine to .63 in grade twelve; for work values from .69 in grade nine to .84 in grade twelve. The authors concluded that the "self-concept in the areas of interests, aptitudes, and work and general values are clarified as boys pass through grades nine to twelve."

Taylor (1953) investigated the consistency of the self-concept when described repeatedly over a period of seven and one-half months. The subjects were 152 undergraduates, 5 graduate students, and 20 adults. He found that while the self-concept remains relatively stable over the time interval studied, with increased self-ratings there is a trend toward consistency of self-report. The ideal self-concept appeared to be more stable than the self-concept. He concluded that with introspection, there is a reorganization of the self-concept in the direction of a more positive, consistent organization.

Arsenian (1942) studied the accuracy of students' self-estimates of scholastic aptitude, achievement, adjustment, and interests. Using entering college freshmen he found that self-estimates made prior to testing did not correspond well with objective measurements, but that estimates made of "abilities and knowledge are more clearly related to objective measurement when rating by students is done after taking the test than before. The variability in estimates continues to be large." The ratings made after taking the tests showed a downward revision in the direction of more accurate self-estimates. Those students who grossly over- and under-estimated their subsequent test performances were found to be generally less intelligent and less well adjusted.

Torrance (1954) conducted a study quite similar to the one done by Arsenian and found essentially the same results. Entering college freshmen first completed a self-rating sheet on which they compared themselves with others. This was repeated following the orientation and testing program and again after five weeks. There was little relationship between self-ratings and objective test performances. For example, over 65% of the total group estimated themselves to be within the upper quarter in scholastic ability and 95% estimated themselves to be in the upper half. Among those who achieved within the bottom quarter, 62% estimated that they would score within the upper quarter, and 92% believed that they would score in the upper half. As in Arsenian's study, when given a chance to re-evaluate themselves, there was a general revision downward in the direction of more realistic self-evaluations. Women evaluated themselves more accurately than men, but they under-estimated themselves more frequently. Subsequent clinical personality studies revealed that those students whose self-estimates were most unrealistic were "plagued socially, economically, emotionally, and sexually by an exaggerated sense of vulnerability." Torrance believes that the inclusion of self-rating within a testing program induces a mental set which stimulates self-evaluation, even when test information is not presented to students during the intervals between self-ratings. He also found that encouragement to further examine the self-concept further increased the accuracy of self-report. Discussion of self-estimates with peers may have been a factor contributing to the observed increasing accuracy in self-report. "As classes get under way, the set for self-evaluation seems to continue to operate. It was surprising to see how much more realistic the estimates had become by the end of five weeks in conferences with counselors and faculty advisers."

Froelich and Moser (1954) investigated the accuracy of clients' recall of test scores following test interpretation. They administered the DAT to 150 ninth-graders and presented their test results in a series of group meetings and individual interviews, at which time each student drew a copy of his test profile. The students were allowed to keep these profile copies, and they were instructed to request further help if they desired. Fifteen months later the students were requested to draw their test profiles from memory. The investigators found that a large proportion of students did not report their scores accurately. "The level of accuracy varied from test to test. More pupils reported their highest score accurately than reported their second highest score correctly. Errors in reporting were made by both high and low ranking pupils. A larger proportion of brighter pupils, however, reported scores accurately than did the less bright. The data provided inconclusive evidence supporting the hypothesis that pupils tend to generalize their reported ranks on the subtests of the DAT in terms of their achieved ranks on the verbal tests.

Froelich (1954) investigated the problem of whether test-taking changes self-estimates of those characteristics being measured by the tests. The subjects used were 50 members of an adult evening class in vocational aptitude testing. A chi-square test using pre- and post-ratings and test scores failed to reveal any systematic change in self-rating from the pre- to post-testing situations.

Bedell (1941) investigated the relationship between measured and estimated vocational interests for a group of college freshmen women who had arrived at a definite vocational choice. Before counseling, each student estimated her vocational interests in terms of her liking for her chosen occupation compared to those already successfully engaged in that occupation. None of the obtained correlation coefficients indicated a close relationship between measured and estimated interest scores. The investigator inferred that the conclusions from the study "lend increased support to personnel workers who insist that students' self-estimated vocational interests are insufficient evidence upon which to diagnose the amount of satisfaction that will be obtained in a vocation." Adamek (1961) has criticized this study for faulty structure and analysis. It was assumed that no clear relationship between estimated and measured vocational interests were identified in this group because no high correlation coefficients were obtained. The clarity of relationships, Adamek points out, is not a function of degree alone, for any failure to observe significant relationships can be due to chance factors or to an underlying high degree of true relationship which is obscured by measurement error. The assumption that the subjects had made a definite vocational choice is also open to criticism. This assumption was based on the grounds of chosen curriculum alone, and when it is considered that the sample contained only those women who requested clinical counseling as an adjunct to an orientation course, the assumption of a definite vocational choice appears a gratuitous one, indeed.

In a similar study, Crosby and Windsor (1941) investigated the effectiveness with which agriculture and home economics majors in sophomore general psychology and educational psychology courses could predict their interest test profiles as measured by the Kuder Preference Record. Before taking the Kuder, the interest scale was described briefly. The students then estimated the percentile score they would earn, compared to the general college population. Correlations between estimated and measured interest scores showed a mean r of .58 with a range from .39 for the Social Service scale to .66 for the Persuasive and Computational scales. It was found that the more intelligent students, as measured by scholastic aptitude scores, made fewer errors in estimating their interest scores than the less intelligent students. The only observed sex difference was that of the superior ability of women to estimate scores on the Social Service scale. The investigators noted a tendency for students to over-estimate their interest scores in comparison with the general college norms. The investigators stated that "one implication brought out in the study is that there seems to be less discrepancy between the estimates and actual scores on interests closely connected with students' vocational choices."

Schulman (1956) studied self-understanding among secondary school students. Hypothesizing that the learning experienced by students during a three year period of high school education would contribute to a more realistic appraisal of their abilities, Schulman matched samples of ninth and twelfth-grade students in order to compare the differences in accuracy of self-understanding. Before the students were administered the DAT, they rated themselves on eight subtests of the DAT following group discussions led by experienced school counselors to provide the students with an understanding of the required task. Analysis of variance and a comparison of correlations were used to determine the differences in accuracy of self-report between ninth and twelfth-graders. The investigator concluded: (a) high school seniors have a more realistic understanding of their relative position in their own grade on the abilities measured than do high school freshmen; (b) accuracy of self-report for both groups was positively related to the extent to which the abilities measured corresponded with content areas in the high school curriculum; (c) during this three-year period, continuous and well-defined instruction in specific areas of the high school curriculum produces greater self-understanding among students in those areas. In terms of the increasing accuracy of self-report as students pass through the grades, these results support those obtained by O'Hara and Tiedeman.

Wright (1957) compared the effectiveness of test interpretation conducted in individual interviews with test interpretation conducted in group situations. He hypothesized that both experimental groups would make significant gains in accuracy of self-ratings, acquisition of information about tests, feasibility of stated vocational choice, and client satisfaction. He also predicted that there would be no post-counseling differences between the two groups.

The sample contained 750 entering freshmen at Brigham Young University. They were chosen at random, stratified by age and sex, and divided into three groups of 250 each. The members of the two experimental groups were invited by letter to make an appointment to review the results of their freshmen guidance examinations. Members of one experimental group received their test interpretatio in individual interviews, and the other experimental group met in small groups of five to ten students each to review their test results. The groups were comparabl in terms of age, sex, intelligence, and high school grade-point average. There were no significant differences between groups on the pre-counseling measures.

The accuracy of self-ratings was examined by assessing similarities between the students' estimated test profile and the actual profile of their test scores. Test scores were reported in quintiles, and the students estimated their performance on a five-point scale for each subtest in the test battery. Comparisons on this criterion measure were made between mean accuracy ratings of each group and in terms of the frequency of correct and incorrect test score predictions. The test battery included the American Council on Education Psychological Examination, the Kuder Preference Record, Vocational, and the Cooperative General Culture Test.

The acquisition of information was measured by the results of a quiz covering areas which seemed important for valid test interpretation. The use of this criterion was based on the idea that students must have some knowledge about tests in order to properly interpret their results.

Feasibility of stated vocational choice was determined by three counselors who independently judged whether they felt the choice to be appropriate in view of the students' measured ability, interests, and achievements. The final ratings were determined by the concurrence of two of the three judges.

The degree of client satisfaction was measured by a questionnaire completed by students immediately following test interpretation and again three months later. The questions were designed to sample student attitudes regarding the warmth of the relationship, coverage of test information, clarity of test interpretation, and the value of the interpretation for educational and vocational planning.

Following counseling, both groups showed significant increase in accuracy of self-ratings of aptitude and achievement. Only those students who received their test information in individual interviews increased the accuracy of self-rating on interests. Neither group showed significant change in stated vocational goals during the time covered by the study. There were no post-counseling differences between the two experimental groups in terms of the amount of information remembered about tests; however, among the students who were counseled individually, a greater number improved in the acquistion of information. Students who were seen individually reported greater satisfaction with the interview, but after three months much of this difference had disappeared. The students seen individually made a greater change toward neutral evaluation of test interpretation and satisfaction.

Summary of Related Research

The preceding section has attempted to review the pertinent research and theoretical literature relative to the increase in accuracy of self-estimates resulting from a systematic interpretation of test results, the use of the self-rating device as the criterion of test interpretation effectiveness, and the differential effect of various methods of presenting information to students. The following conclusions are supported by the literature reviewed above:

1. Most of the research has used high school and college students as subjects. Rarely does test interpretation to students below grade eleven or twelve result in increased accuracy of self-perception. In this respect, student maturity appears to be a significant variable in the effectiveness of test interpretation.

2. In few of the studies reviewed was any systematic attempt made to respond to the affect during the test interpretation interview. The primary emphasis in the majority of the studies has been upon giving information without giving specific attention to the client's emotional reactions to the information presented about himself.

3. It is evident that while a considerable amount of effort has been spent in presenting test information to students in clear and meaningful ways, students do not accept, and in most cases, do not even learn this information about themselves well enough to reproduce it without omissions and discrepancies. This supports the conclusion that the information-giving approach to test interpretation has not produced the effects claimed for it by many counselors and test publishers.

4. Self-rating devices have been useful tools in assessing individual self-perceptions of interests, abilities, and values. Comparisons of discrepancies between self- and test-estimates taken before testing, following testing, and following test interpretation have provided measures of changes resulting from testing and from test interpretation.

5. Increased accuracy of self-estimates does occur following test interpretation, and this improved self-estimate appears to be maintained over time.

6. Differences in counseling techniques employed in these studies have not been systematically related to increased accuracy of self-estimates. Some of the evidence is at least suggestive that counselor personality characteristics are

more closely related to gains in client-understanding than the counseling techniques employed.

Distinctive Features of the Present Study

There are four distinct features which characterize the present study. First, it attempts to ascertain the effects of orientation to testing upon student ability to profit from test interpretation. This variable has not previously been investigated. Second, although lack of orientation to testing has recently been cited (Adamek, 1961) as a possible cause of negative or inconclusive results in studies dealing with the effectiveness of test interpretation, previous studies have not attempted to control the variable of motivation for learning about self through test information. For example, it might be found that those students who already have an accurate self-perception are not motivated to learn about themselves through the interpretation of their test results. Third, in addition to describing the qualifications of the counselors, this study presents a systematic description of the test interpretation process employed. Such descriptions are frequently not reported in previous research. This is essential if this and similar studies are to be adequately replicated. Fourth, this study uses students at grades 5, 7, 9, and 11; and perhaps the most distinctive feature of the study is that it may provide some clues regarding the age and grade levels at which test interpretation can be used most effectively. Previous studies have been limited mainly to high school and college level students. With the downward extension of testing into the elementary schools has come the tacit assumption that testing serves similar functions for elementary school children. This may not be the case.

CHAPTER III

Instruments Used in the Study

The instruments used in this study consist of (a) the battery of standardized tests, (b) the Self-Rating Scale, and (c) the Counseling Request Form.

Standardized Tests Battery

The test selected for administration in this study are representative of test batteries commonly given and interpreted in public schools: measures of achievement, intelligence, and interests.

The main criteria for inclusion of particular tests were:

(1) The tests should provide results which are sufficiently reliable and valid to help teachers in diagnosing learning difficulties, assessing interests, and planning individualized instruction.

(2) The results of such tests should, when interpreted, provide students with a meaningful appraisal of abilities and interests, i.e., aspects of the self-concepts relevant to successful school adjustment.

1. Achievement

In grades five and seven, the Iowa Tests of Basic Skills, Form 1, were administered. These tests yield scores on vocabulary, reading, language, work-study skills, and arithmetic.

The Iowa Tests of Basic Skills were standardized on a sample of 74,000 pupils in 213 school systems. The attempt at achieving a stratified random sample of communities was successful except for shortages of rural children in the east north central region and of children from south central communities of 100,000 or over (Remmers, 1959).

While attention must be given to specific content in any adequate achievement battery, the ITBS have emphasized generalized understandings rather than recall of specific bits of information.

The ITBS are among the most reliable achievement tests available. The reported split-half reliabilities range from .84 to .96 for the tests and from .97 to .98 for the composite score. Since these data were obtained from tests administered at the beginning of the school year, one would expect mid-year and end-of-year reliability coefficients to be even higher (Herrick, 1959).

The reported intercorrelations among tests range from .37 to .83, with most of them reanging from .60 to .70. This suggests that a factor analysis of these data might reveal that two or possibly three abilities are being measured rather than five (tests) or eleven (subtests) and that reading and vocabulary would account for most of the observed variation (Herrick, 1959). This is a valid criticism against interpreting these tests to individuals, since doing so implies that information is being conveyed about independent skills.

In grades nine and eleven, the Iowa Tests of Educational Development, Form X3-S, were administered. Of the nine tests available in the class period length, the following were administered: Test 1, Background in the Social Sciences; Test 2, General Background in the Natural Sciences; Test 3, Correctness and Appropriateness of Expression; Test 4, Ability to do Quantitative Thinking; Test 8, General Vocabulary.

As in the case of the Iowa Tests of Basic Skills, one of the reasons for selecting these tests was that the items were designed to sample understanding and ability to apply concepts rather than the recall of specific information, per se.

The odd-even reliability coefficients for these tests ranged from .84 on Test 4 to .94 on Test 8 with a coefficient of .98 for the composite score for grade nine. In grade eleven, the odd-even reliabilities for the tests ranged from .87 on Tests 2 and 3 to .95 on Test 8 with a coefficient of .98 for the composite score (data collected in September, 1960). (Obtained by writing to the publisher.)

The intercorrelations among subtests ranged from .40 to .78 on Form Y-2, and it is assumed that similar results would be obtained from Form X3-S. Most of the intercorrelations were in the .60's. As in the case of the ITBS, these high intercorrelations present a criticism against using these tests as separate measures for individual interpretation. Correlations of ITED composite scores with first year grades in college range from .56 to .63 (five studies reported) in grade nine and from .47 to .72 in grade twelve (nineteen studies reported). The median correlation coefficients were .58 and .60 for grades nine and twelve, respectively (1957). These validity coefficients compare very favorably with those of competing achievement batteries.

2. Intelligence

The Henmon-Nelson Tests of Mental Ability, Form A, were administered to all grades studied in this investigation. These tests were selected because they provided reasonably reliable and valid measures of general intelligence with a minimum of testing time.

The average test-retest reliability coefficient of the twenty-four coefficients reported in the literature is .94 with values ranging from .90 to .97 (Lefever, 1959).

The validity evidence for the Henmon-Nelson Tests is highly satisfactory, expecially in view of their length (30 minues working time). The median coefficient for total achievement battery scores and IQ's is .79 with a range from .64 to .85. Average grades and IQ yielded a median correlation coefficient of .60 with a range from .09 to .74. Correlations between IQ's and achievement subtests for various grade levels ranged from .65 to .76. Median correlations between IQ's and teachers' grades for various grade levels ranged from .53 to

.71 (Lefever, 1959).

It is recognized that the issue of a general intelligence factor versus specific mental factors has not yet been resolved; however, for the purpose of this study, it was felt that the single score yielded by the Henmon-Nelson Tests was preferable. It should be noted in this connection that the multifactor tests have not consistently demonstrated differential prediction superior to that yielded by single-score tests (Lamke and Nelson, 1957; Super, 1957).

3. Interests

In grades five and seven, the What I Like to Do: An Inventory of Children's Interests (Bonsall, et. al., 1954) was administered. Few interest inventories are suitable for use at these grade levels. Any measures of interests secured at these levels should be considered relatively unstable and of limited predictiv value (Rothney, 1959; Bonsall, et. al., 1954). However, they may be useful to teachers by providing them with a general appraisal of children's most prominent interest areas. It has been suggested, however, (Rothney, 1959) that analysis of item responses might yield more information about children's interests than the What I Like to Do profile. The What I Like to Do was selected primarily because of reasonably high reported internal consistency coefficients of reliability for grades five and seven. While no validity evidence was available at this time, it was felt that the interest areas of art, social studies, music, active play, quiet play, manual arts, home arts, and science would be meaningful ones for pupils at those grade levels.

The Kuder Vocational Preference Record, Form C (1960), was administered in grades nine and eleven. It was recognized that interests are relatively unstable in grade nine. However, it was felt that self-exploration of the kind facilitat by the Kuder could profitably begin as early as grade nine. The Kuder Vocational

Preference Record with the ten broad interest areas was chosen over such interest inventories as the Kuder Occupational, Form D and the Strong Vocational Interest Blank because: (a) interests of students in grade nine are not sufficiently stablized to permit predictions based on specific occupational scales, and (b) the purpose of this investigation did not include educational and vocational planning, per se, as would have been implied to ninth and eleventh graders by the use of the scores reported on the Kuder, Form D and the SVIB. The problem of interpreting interest areas encountered in grades five and seven was not noted to any great extent in grades nine and eleven.

The Self-Rating Scale

The self-rating scale was designed in two forms: grades five and seven and grades nine and eleven. The rating scales attempted to describe, in language appropriate to the grade level the areas measured by the respective tests. The rating scales were designed to provide the following kinds of information:

(1) Students' present estimates of their performance on the respective subtests of the test battery. Students were instructed to indicate this estimate by checking one of five statements from "Very much more than most students my age" to "Very much less than most students my age."

(2) Students' current satisfaction with their estimated performance. Student were instructed to indicate this satisfaction by checking one of five statements from "I very much like being this way" to "I very much dislike being this way."

(3) Students' current ideal performance on the respective subtests of the test battery. Students were instructed to indicate this ideal performance by checking one of five statements from "Very much more than most students my age" to "Very much less than most students my age."

(4) Students' estimated accuracy of their self-ratings of the respective subtests of the test battery. Students were instructed to indicate the estimated

accuracy of their self report by checking one of five statements from "I know almost exactly how I compare with others" to "I really don't have any idea about how I compare with others."

This instrument is similar to one used by Adamek (1961). Test-retest reliabilities on the self-rating scale used in his study ranged from .61 on "Outdoor" to .96 on "Literary" for the Kuder Preference Record, Vocational, from .60 on "Reasoning" to .97 on "Number" for the Chicago Primary Mental Abilities, and from .54 on "Getting Along With Myself" to .99 on "My Home" for the SRA Youth Inventory, Form A. For the following reasons it was necessary to determine reliabilities for this version of the instrument:

(1) It was adapted to the maturity levels of fifth and seventh graders.

(2) Since a different test battery was used in this study, changes were made in the content of the items on the instrument.

(3) Rather than asking students to check along a five-point horizontal scale, as in Adamek's instrument, students were asked to make judgments with reference to five verbal categories.

(4) Adamek's instrument did not include *estimates of students' satisfaction* with self-estimates or estimates of the accuracy of their self-estimates.

The sample chosen for assessing test-retest reliability of the instrument was quite similar to the sample used in the investigation proper. In terms of school size, organization of the guidance programs, approaches to group testing, and the use of tests in counseling, this sample was quite representative of the larger sample. However, it is believed that this sample differed from the larger sample on the variable of parent educational level. The sample used in the investigation contained the children of several University of Illinois staff members who lived in small cities near the Champaign-Urbana campus.

It is not possible to determine whether the estimates of reliability of the instrument obtained from this small sample are unrepresentative of the reliabilit for the sample used in the investigation; however, certain effects of the differences on the variable of parent educational level can be hypothesized. Lower reading levels at all grades tested may have lowered reliability due to failure to understand certin items and directions. Containing fewer children from professional families, this sample may have been characterized by less interest in self, which could have contributed to lower reliability through random answering of the instrument rather than concentrating on the personal meaning of the items. This hypothesis, of course, rests upon the assumption of greater need achievement among children from professional families which is, in turn, reflect in higher interest in information about self.

Recognizing that children's perceptions of interests and abilities change rapidly, it was decided to assess the test-retest reliability over a short time interval. One hundred students (grade five, 22; grade seven, 26; grade nine, 27; grade eleven, 25) were tested twice within a four-day period. The reliability coefficients reported in Tables I and II were obtained. Examination of these reliability coefficients reveals that the median correlations for estimates of actual performance, satisfaction with actual performance, and ideal performance for all grades were approximately .60. Chi-square tests were used to test the independence of the size of correlations and (a) grade levels and (b) types of self-estimates. None of the obtained chi-square values were significant at the .05 level, suggesting that consistency of self-estimates is unrelated to grade level and types of estimate made. However, this should be considered a tentativ finding, since comparisons regarding grade level were possible only between grades five and seven and between grades nine and eleven due to the use of different tests at high school and elementary levels. In addition, the number o frequencies used in the contingency tables was small.

TABLE I

Test-Retest Reliabilities for Self-Rating Scale

Grades 5 and 7

	Actual Estimate		Satisfaction		Ideal Estimate	
	5th	7th	5th	7th	5th	7th
Achievement						
1. Vocabulary	.10	.76**	.37*	.89**	.71**	.40*
2. Reading	.77**	.63**	.54**	.39*	.67**	.60**
3. Language	.35	.80**	.50**	.53**	.06	.69**
4. Work-Study Skills	.63**	.51**	.01	.29	.86**	.76**
5. Arithmetic	.31	.82**	.65**	-.58**	.39*	.67**
Intelligence	.61**	.45*	.83**	.58**	.61**	.42*
Interests						
1. Art	.87**	.81**	.59**	.57**	.67**	.70**
2. Music	.72**	-.15	.60**	.63**	.57**	.48**
3. Social Studies	.51**	.31	.44*	.35*	.50**	.66**
4. Active Play	.43*	.65**	.60**	.54*	.72**	.57**
5. Quiet Play	.47*	.67**	.06	.35*	.08	.52**
6. Manual Arts	.17	.86**	.19	.74**	.03	.66**
7. Home Arts	.50**	.69**	.32	.40*	.83**	.89**
8. Science	.88**	.82**	.41*	.16	.84**	.43*

* .05 level of significance — For grade 5, N= 22

** .01 level of significance — For grade 7, N= 26

TABLE II

Test-Retest Reliabilities for Self-Rating Scale

Grades 9 and 11

	Actual Estimate		Satisfaction		Ideal Estimate	
	9th	11th	9th	11th	9th	11th
Achievement						
1. Understanding Basic Soc. Conc.	.76**	.31	.51**	.40*	.49**	.89**
2. Background in the Nat. Sciences	.54**	.71**	.22	.61**	.65**	.68**
3. Correctness & Approp. of Exp.	.66**	.65**	.45**	.66**	-.20	.64**
4. Ability to do Quant. Thinking	.79**	.58**	.08	.95**	.78**	.71**
8. Gen. Vocabulary	.51**	.55**	.37*	.68**	.76**	-.32
Intelligence	.64**	.48**	.45**	.45*	.52**	-.06
Interests						
1. Outdoor	.96**	.21	.52**	.74**	.78**	.62**
2. Mechanical	.78**	.88**	.94**	.74**	.75**	.84**
3. Computational	.67**	.78**	.43*	.56**	.51**	.70**
4. Scientific	.70**	.67**	.38*	.11	.58**	.12
5. Persuasive	.44*	.69**	.52**	.60**	.63**	.23
6. Artistic	.45**	.71**	-.10	.70**	.61**	.90**
7. Literary	.54**	.70**	.22	.40*	.33	.32
8. Musical	.93**	.77**	.72**	.68**	.37*	.88**
9. Social Service	.55**	.71**	.77**	.39*	.34*	.41*
10. Clerical	.75**	.62**	.52**	.58**	.50*	.43*

* .05 level of significance
** .01 level of significance

For grade 9, N= 27
For grade 11, N=25

The Counseling Request Form

The Counseling Request Form used in grades five, seven, nine, and eleven, was designed by the writer to secure students' responses to the opportunity to participate in individual test-interpretation counseling interviews with members of the research staff. These responses were used as criteria of motivation for learning about self though test interpretation. When the test battery was completed, students were told that all of them would be able to meet privately with a counselor to talk about their test results in order to learn more about themselves. At this time they were asked to check one of three statements on the request form:

1. I would like to talk about my test results with a counselor to learn more about myself.

2. I am not sure at this time whether I want to talk about my test results with a counselor to learn more about myself. I will decide about this in a few days.

3. I would rather not talk about my test results with a counselor to learn more about myself.

Students who checked the second statement were given one week to make a decision regarding participation in the test interpretation interview. At the end of the week, forms were returned to these students, and they were asked to check either the first or third statement. The final responses to the Counselin Request Form represented the two categories of motivation considered in this investigation: (1) request for test interpretation interviews and (2) requests not to participate in test interpretation interviews.

CHAPTER IV

Procedures

Selection of Sample

When school systems were initially considered for inclusion in this investigation, attention was given to the following considerations: size of school, amount of testing, amount of test interpreting done by the counselor, and the socioeconomic background of the students. School administrators also were required to agree to allow students in grades five, seven, nine, and eleven to participate in the orientation (in one half of the schools), complete the test battery and other instruments, and participate in test interpretation interviews.

Five school systems meeting these criteria were selected within a twenty-mile radius of the University of Illinois campus. When school administrators were contacted and invited to participate, they were told that this project would serve two main functions for their schools in addition to supplying data for this investigation: (1) provide test information useful to teachers and counselors, and (2) assist students to achieve greater self-understanding through knowledge of their test performances. Every school invited to participate in the investigation did so.

In order to provide the participating schools with complete test results for the grades tested, all students in each of grades five, seven, nine, and eleven were given the test battery and other instruments. Then 100 students per grade level in each of the two treatment groups were selected.

It was believed that the variable of socioeconomic class, if unequally distributed between Orientation and Routine groups, might influence motivation for test interpretation and possibly outcomes of test interpretation. This assumption is based on the socioeconomic class differences with respect to academic achievement motivation and intelligence level. It was decided to secure a gross index of socioeconomic level of the children in the study from the fathers' occupational levels. Certainly other factors are included in the definition of socioeconomic class, but for the purposes of this investigation it was believed that the occupational level of the father would provide a sufficiently reliable index.

The occupational level was determined by recording each father's occupation according to a modified Dictionary of Occupational Titles classification includin the following categories:

1. Professional and managerial occupations.
2. Clerical and sale occupations.
3. Service occupations.
4. Farm operators and managers.
5. Skilled occupations.
6. Semiskilled and unskilled occupations.
7. Mother widowed, divorced; father or stepfather not in home.

In order to obtain equal numbers of students from each of the seven categories of the occupational classifications for both Orientation and Routine groups, random numbers were used to determine which students were selected for the total sample from each grade level and occupational level.

Orientation

Separate Orientation statements (see Appendices A and B) were prepared for use in grades five and seven and grades nine and eleven. These statements were read verbatum to students. Workers delivering Orientation statements were instructed to: (a) tell students that the statement was being read to prevent omissions and to communicate accurately, (b) ask students to ask questions at any time, (c) watch for evidence that students had questions and even though they had not raised their hands to question, and (d) provide ample time for questions and discussion following completion of the prepared statement.

Orientation was conducted in English classes in grades nine and eleven and in self-contained classrooms in grades five and seven. The Orientation treatment was used in two school systems and the Routine treatment was used in two other systems.

In a fifth system, one half of each grade received the Orientation treatment and the other half was not given Orientation. This was done to allow investigation of the extent to which students in the two treatment groups communicated with each other about the information delivered in the Orientation statement. In this school system following test administration, students in the Routine groups were asked whether they had talked with anyone from the Orientation groups about what tests were and what they could learn from them.

Administration of Standardized Test Battery and Other Instruments

The test administration was handled by second and third-year doctoral students and by some masters students enrolled in guidance and other phases of education. No workers were used for test administration who were not at least candidates for the masters degree. Those selected for administering the tests were required to be familiar with the tests being administered, to have had experience in testing in the public schools, and were carefully briefed on administration of the tests.

1. First Self-Rating Scale

In the Orientation group, following the Orientation treatment, the first self-rating scale was administered. This was done at the end of the period during which students talked about testing and what they could learn about themselves from tests.

2. Standardized Test Battery

In grades five and seven the entire test battery was administered within self-contained classrooms. Testing periods were divided into half-day sessions. The tests were administered in the following order: achievement, intelligence, and interests. In grades five and seven the total testing time was 449 minutes.

In grades nine and eleven, the tests were administered to students in groups containing the entire ninth or eleventh grade class whenever possible. The tests were administered in the same order as in grades five and seven. The total testing time for this battery was 352 minutes.

The additional 97 minutes of testing time was required in grades five and seven because the Language and Work-Study Skills tests of the Iowa Tests of Basic Skills contained four and three subtests, respectively, raising the administration time. While the testing time required in grades nine and eleven was considerably shorter, the lengths of time spent per section on intelligence and achievement measures were quite similar.

3. Second Self-Rating Scale

Upon completion of the test battery, students were instructed to complete the rating scale for a second time. They followed the same directions as were given during the first administration; however, they were instructed to answer as they believed they were at that time. They were told that their second self-ratings might be very much like their first ones, but that they should not hesitate to make changes in their second ratings if they really felt differently about themselves at that time.

4. Counseling Request Form

The Counseling Request Form was administered immediately following the second administration of the self-rating scale.

Test Interpretation Procedure

The test interpretation interviews were handled by: three third-year doctoral students in guidance; one third-year doctoral student in clinical psych ogy; five first-year doctoral students in guidance; four students taking work in guidance beyond a masters degree; three candidates for the masters degree in guidance; one person with a doctorate in psychology; two persons with doctorates in guidance. Of these nineteen persons, only two had not had supervised practice in counseling: a first-year doctoral student in guidance who was taking the cou at the time he was doing test interpretations; the person with a doctorate in psychology.

Before test interpretations were begun in the schools all test interpreters received a detailed description of the research design and the test interpretatio procedure. They were also required to familiarize themselves with the test battery and the self-rating scales as well as participating in role-playing interviews with the investigator.

Interviews were scheduled according to the order in which students checked the Counseling Request Form. Interpretations were given first to those students who stated that they wished to have their tests interpreted and last to those who indicated no desire to have their tests interpreted. The students who stated that they did not wish to participate in test interpretation were contacted by the investigator and told that even though they had not wished to learn about themselves, they had given their time and the investigator wished to make this service available to them even though they had not requested it. Then the tests were interpreted to those students also, unless they strenuously objected. In only a very few instances did this occur.

Each interview was scheduled for thirty minutes. Additional time was made available to those students who requested it. In many cases, it was noted that students had problems which they wished to examine, but these were not problems directly related to an examination of their test results. In such cases, the names of these students were recorded and they were referred to the counselor in the school.

The method of test interpretation employed emphasized three factors: client involvement, the giving of information by the counselor, and the counselor's responses to client affect.

Involvement. Counselors provided students with copies of the tests include in the standardized battery. Students were asked to recall the tests under discussion, and frequent reference was made to copies of the tests. Students we also asked to estimate their performance on each subtest by checking a five-point scale (see Appendices G and H).

Information. Students were shown on the same scale how they actually score on each subtest. Exact scores were not given, but descriptions of students' performances were couched in such terms as "did as well as most your age," "did better than most your age," "did very well," "didn't do as well as most your age, or "did very poorly." Interviewers attempted to help students express in their own words what their test results meant to them. This enabled the counselors to determine whether they had been clear in presenting the information and/or whether the students understood the information but had difficulty accepting it.

Dealing with Client Affect. The counselors attempted to respond to the feelings expressed regarding test results with acceptance and understanding. Students frequently had difficulty accepting information which was inconsistent with present self-estimates. This occurred when students had underestimated as well as overestimated their test performances. No attempts were made to defend the test results or convince students that they should agree with them. The counselors attempted to help the students tell why they found it difficult to accept results which differed from self-estimates.

The self-rating scale was completed a third time following the test interpretation interview. Students were instructed to answer according to their self-perceptions at that time. They were cautioned to answer in terms of their test results only if they actually believed them; otherwise, they were instructed to answer as they actually believed they were.

After a two-month period, the rating scale was again administered with instructions similar to those given on the third self-rating occasion.

Summary

This chapter described the procedures used for (a) sample selection, (b) Orientation, (c) administration of test battery and self-rating scales, and (d) test interpretation.

The four schools used in this study were selected because they satisfied th criteria of size, amount of testing, amount of test interpretation usually done, and the occupational levels of children in the grades studied. One hundred students were selected for each treatment group at each of four grade levels. A fifth school was selected in which both treatments were employed to test the effects of communication between experimental groups.

The Orientation treatment was conducted in self-contained classrooms in the elementary school and in English classes in the secondary schools. Testing was also conducted in self-contained classrooms in the elementary schools, but in large groups in the secondary schools.

The test interpretation interviews were scheduled according to students' level of motivation for learning their test results. These interviews emphasize three factors: (a) client involvement, (b) the giving of information by the counselor, and (c) the counselor's responses to client affect.

CHAPTER V

The Instruction For Counselors

The Test Interpretation Manual, comprising the body of this chapter, was used by counselors who served as interviewers in this study. The procedure which was used is presented here in order to enable school counselors, and others who interpret test results to individuals, to study and adapt the methods for their own use.

Students will participate in the test interpretation process. To facilitate this participation an interview sheet will be completed conjointly by student an counselor during the interview. Each of the subtest names will be followed by a horizontal line of approximately 6" in length. These lines will be divided into five segments corresponding to five percentile bands. These bands will be described to the student as follows: "The middle band includes the scores of most persons of your (the students) age (middle 50%); the band to the right of the middle band includes the scores of students who do somewhat better than most students your age (75-89 percentiles); the band to the extreme right includes the scores of students who score much better than most students your age (90-99 percentiles); the band to the left of the middle band includes students who scor somewhat less well than most students your age (10-24 percentiles); the band to the extreme left includes students who score much more poorly than most students your age (below the 10th percentile)."

It may happen that the student will place his self-estimate in one end of a band on the interview sheet, while his percentile score on a subtest falls near the opposite end of the band. In such cases, it is necessary to determine whethe the difference between the student's self-estimate and the actual test performanc is statistically significant. To determine this, the following procedure will be used:

> A sheet of tables for each grade is provided indicating percentile ranges within each band which represent significant differences. These ranges were determined by finding the standard error of measurement for each subtest in the test battery and converting them to percentile bands. If a percentile band, when added to the student's self-estimate, overlaps with the band added to his test estimate, chance can account for the difference between the estimate and the actual score. If these bands do not overlap, the chances are two to one that the discrepancy represents a significant difference.

Before rating himself on a subtest, the student will be asked to recall the specific content of that subtest. To accomplish this, counselors should show the student copies of the tests to help him recall what they were like. The student will estimate his performance by placing a "✓" in the line segment which corresponds to his estimate of his performance on that subtest. This is done for all of the subtests in the test battery. Then, subtest by subtest, the counselor will indicate the student's actual test performance.

Throughout this procedure, the counselor will attempt to elicit the student's feelings about these discrepancies. Perhaps the best thing the counselor can do is to call the discrepancy to the student's attention and then respond to the affect associated with his response. At this point, it is very important that the counselor detect and respond to such feelings as joy, approval, disappointment, fear, happiness, or disagreement. The counselor must be able to respond quickly and appropriately to the true feeling which the student manifests regarding these discrepancies. The counselor should also encourage the student to contribute non-test information about himself which has a direct bearing on the discrepancies observed. Even when there are no significant discrepancies between self-estimate and test scores, the student may manifest some affect. The counselor should be alert for affect in this situation, and should deal with it in the manner specified above.

The sequence of interpretation will be as follows:

> First, the counselor will ask the student to estimate his performance on all subtests of the test battery. The counselor will briefly describe each subtest before the student makes his estimates, using copies of the tests to help the student recall subtest content when necessary. After the student has estimated his performance on all subtests, the counselor will then place a red "X" on the bands corresponding to the test estimates. The counselor will then examine with him any reactions the student may have toward his scores or discrepancies between estimates and scores.

This procedure will enable student and counselor to focus their attention more clearly on those aspects of test information which are not consistent with the student's present self-evaluations. Those points on which the student already has an accurate self-evaluation and manifests no significant affect will not be ignored; they will be reinforced by noting with the student that his self-estimate on those subtests are in agreement with his test estimates.

Principles of Test Interpretation*

The following principles may be drawn from the literature:

1. Orientation for acceptance and use of test results should precede testing.
2. Until someone is qualified to use and interpret a test, that test should not be given.
3. During the test interpretation, the counselor should encourage the pupil to supplement the test results with non-test data about himself which will help make the test results more meaningful.
4. The one who interprets test scores should encourage pupil participation in interpreting test scores. To help a pupil recall what a test, or a part of a battery, was like, he can describe it in non-technical language, and he may even find that it is helpful to show the pupil sample items from the test before encouraging the pupil to estimate how well he did on it. If he is to do this successfully, it is obvious that he must know the pupil, or at least be familiar with this type of pupil, and be thoroughly familiar with the test in order to communicate accurate information to the pupil.
5. The one who interprets test scores must be very sensitive to cues which suggest that the pupil does not comprehend the information which is being given him.

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*Merle M. Ohlsen. Chapter 12, National Society for the Study of Education Yearbook, manuscript in preparation.

6. The pupil should be encouraged to react to the test results -- to raise questions or to comment on how he feels about the way the test or tests describe him. When he feels that these comments are appropriate, a pupil will often respond to data quite spontaneiously -- telling how pleased he is with some scores or how he doesn't like or cannot accept others. For those who interpret test scores, it is important that they detect these feelings and that they be able to respond to them. Helping the pupil examine these feelings increases the chances for helping him to understand and accept himself as he is.
7. Obviously, there is no justification for arguing with a pupil about his test scores. Moreover, little can be accomplished by either defending a test or criticizing it. What the one who interprets the test should do is explain how the results may be used by the pupil to understand himself, and to make certain predictions, and with what certainty.

Procedure for Test-Interpretation Interview

"You remember the test you took some time ago. The first test you took was an achievement test. The achievement test tells how much you have learned in your school subjects and how well you are able to use what you have learned. The second test you took was a test of learning ability. This test shows how easily you learn to solve problems in every day life, learn from your experiences, and how easily you are able to learn from books. The last test you took was an interest test. This test tries to show what things you like to do most. That is, it tries to compare your liking for two or more activities. As we talk, I hope you will ask questions when you don't understand what I say, and that you will make comments whenever you disagree with or are pleased with what the test says about you. Also I want you to feel free to mention things you know about yourself which will help us understand what the test results mean for you. If, for example, a particular test shows that you did well in a subject, this might agree or disagree with the kind of work you actually do in school, e.g., your score on the arithmetic subtest might be high, but you might be getting low grades in arithmetic; or, on the other hand, you could make a low score on the arithmetic subtest, but still be making high grades in arithmetic. In such cases, it would be helpful if you would mention things like this as we talk about your test results.

Now, I have here a sheet which lists each of the three tests you took. I am going to ask you to try to remember what each part of these tests was like. Then I want you to decide how you think you did on these tests compared with other people your own age.

Let's look at the parts of the achievement test first. The first part you took was a vocabulary test. A vocabulary test tries to find out how well you understand the meanings of words you read in books and the words you hear your teachers and friends use in speaking. Look at this five point scale and check where you think you scored compared with others your own age. Between these two lines (point them out) is

where most people your age score. Students who do a little bit better than most students your age would fall between these two lines, and students who do a great deal better than most students your own age would fall between these two lines. Students who do somewhat less well than most students your own age would fall here, and students who do considerably less well than most students your own age would fall here. Now, place a "✓" on this scale where you believe you scored on the vocabulary test." (This same procedure will be followed with the remaining subtests of achievement, the intelligence test score, and the entire list of interest scales.)

Definitions of Tests and Subtests

Grades 5 and 7

Iowa Tests of Basic Skills: An achievement test shows how well you have learned the main ideas in your school subjects.

1. Vocabulary - The vocabulary part measures how well you understand words you read and hear others use.
2. Reading - This part measures how well you understand what you read.
3. Language - This part of the test measures how well you are able to spell, use capital letters, punctuation marks, and the proper nouns and verbs in sentences.
4. Work-Study Skills - This part of the test tells how easily you use maps, tables and graphs, and other reference books such as dictionaries and encyclopedias in your school work.
5. Arithmetic - This part measures how well you understand the main ideas in arithmetic and how well you can use these ideas in solving problems.

Henmon-Nelson Test of Mental Ability: This is a test of learning ability which shows how easily you can learn from books and how easily you learn to solve problems in everyday life.

What I Like To Do: An interest test shows how well you like to do certain things.

1. Art - This part shows how much you like doing such things as drawing, painting, soap-carving, and working with modeling clay.
2. Music - This part measures how much you like to listen to music, play musical instruments, and attend musical programs.
3. Social Studies - This part tells how much you like learning about how people in other countries live and work, about how people lived in the past, and about the geography of our world.
4. Active Play - This part tells how much you like doing such things as

baseball, basketball, hopscotch, running, jumping, swimming, etc.

5. Quiet Play - This part tells how much you like doing such things as playing checkers, cards, telling stories, playing guessing games, etc.
6. Manual Arts - This part tells how much you like working with your hands and making things from materials, such as building models, wood-carving, etc.
7. Home Arts - This part tells how much you like doing such things around your house as household chores, helping your mother in the kitchen, or helping your father around the yard or garage.
8. Science - This part tells how much you like to learn things such as how plants grow, where electricity comes from, etc.

Grades 9 and 11

Iowa Tests of Educational Development: An achievement test shows how well you have learned the main ideas in your school courses.

1. Understanding of Basic Social Concepts - This part shows how well you understand and are able to apply the important ideas and concepts in history, geography, economics, and civics.
2. General Background in Natural Sciences - This part tells how well you understand and are able to apply scientific principles and the important part that science plays in the world today.
3. Correctness and Appropriateness of Expression - This section measures how well you are able to express your ideas correctly in writing.
4. Ability to do Quantitative Thinking - This part shows how well you understand and are able to use arithmetic and mathematical principles in the solution of practical problems.
5. General Vocabulary - This part measures how well you understand words you read and hear others use.

Henmon-Nelson Test of Mental Ability: This is a test of learning ability which shows how easily you can learn from books and how easily you learn to solve problems in everyday life.

Kuder Preference Record, Vocational: An interest test shows how well you like to do certain things.

1. Outdoor - This part shows how much you like outdoor activities, such as camping and hiking or living and working outdoors.
2. Mechanical - This section tells how much you like activities in which you work with tools and machines.
3. Computational - This part measures how much you like activities in which you work with numbers.
4. Scientific - This section shows how much you like activities in which you attempt to find answers to scientific questions.

5. Persuasive - This part tells how much you like activities in which you try to get other people to agree with your ideas.
6. Artistic - This section measures how much you like activities that involve making and creating things with your hands.
7. Literary - This part shows how much you like activities that involve reading books and writing.
8. Musical - This section measures how much you like activities involving listening to or playing music.
9. Social Service - This part tells how much you like activities in which you help other people.
10. Clerical - This section shows how much you like activities like those which people in offices do.

Order of Test Interpretation Procedure

In training sessions in which test interpretation interviews were role-played, it was found that there was a tendency for certain steps in the process to be omitted or followed in improper order. For this reason, the following outline is presented as a guide to insure inclusion of all steps in the interview. This will also help to standardize the procedure for all counselors. During the initial period of test interpretation, it may prove helpful to have this list handy while interviews are in progress.

It should be emphasized that this list is only a skeleton outline of the steps to be followed, and it should only be used to supplement the manual, not replace it. All counselors are expected to be thoroughly familiar with the interpretation rationale and procedures before beginning interpretations with students.

1. Counselor introduces himself.
2. Counselor indicates that the student will participate in the interpretation.
3. Counselor helps student recall the three tests he took. (Copies of tests used when necessary.)
4. Counselor encourages student to make comments, ask questions, and contribute non-test information about himself.
5. Counselor describes rating sheet and asks the student to estimate his performance on each subtest of the test battery.
6. Counselor places red "X" on rating scale at the point which corresponds to the student's test score. Counselor then waits for student's reaction, and examines with him his feelings about the scores and any

discrepancies which may exist between the student's estimate and the test score. This same procedure is followed with each subtest.

7. After completing discussion of all subtests, counselor helps student summarize the total test performance and his feelings about it.
8. When student indicates other problems or desire for further test information interviews, schedule additional interview(s) in appropriate manner.
9. Direct student to appropriate room to complete third self-rating scale.

TABLE III

Percentile Equivalents of Standard Error of Measurement Within the Five Bands of Each Subtest

Grade 5

	Band 1	Band 2	Band 3	Band 4	Band 5
Iowa Tests of Basic Skills					
Vocabulary	3	8	10	8	3
Reading	2	7	9	7	2
Language	2	6	8	6	2
Work-Study Skills	2	6	9	6	2
Arithmetic	3	9	13	9	3
Henmon-Nelson Test of Mental Ability	2	5	7	5	2
What I Like To Do (Boys)					
Art	4	13	17	13	4
Music	3	10	13	10	3
Social Studies	4	8	13	8	4
Active Play	4	11	15	11	4
Quiet Play	4	11	15	11	4
Manual Arts	3	9	12	9	3
Home Arts	3	10	13	10	3
Science	2	5	7	5	2
What I Like To Do (Girls)					
Art	5	14	20	14	5
Music	3	11	15	11	3
Social Studies	3	9	12	9	3
Active Play	3	4	12	9	3
Quiet Play	4	12	16	12	4
Manual Arts	3	10	14	10	3
Home Arts	3	9	12	9	3
Science	2	5	7	5	2

Grade 7

	Band 1	Band 2	Band 3	Band 4	Band 5
Iowa Tests of Basic Skills					
Vocabulary	3	8	11	8	3
Reading	2	7	10	7	2
Language	2	5	8	5	2
Work-Study Skills	3	8	10	8	2
Arithmetic	3	9	12	9	3
Henmon-Nelson Test of Mental Ability	2	6	9	6	2

Percentile Equivalents of Standard Error of Measurement Within the Five Bands of Each Subtest

Grade 7 (Continued)

	Band 1	Band 2	Band 3	Band 4	Band 5
What I Like To Do (Boys)					
Art	4	14	18	14	4
Music	4	11	15	11	4
Social Studies	3	8	12	8	3
Active Play	4	12	17	12	4
Quiet Play	4	10	14	10	4
Manual Arts	3	9	11	9	3
Home Arts	3	11	14	11	3
Science	2	6	8	6	2
What I Like To Do (Girls)					
Art	6	13	25	13	6
Music	2	13	17	13	2
Social Studies	3	8	11	9	3
Active Play	3	11	14	11	3
Quiet Play	4	13	15	13	4
Manual Arts	4	13	17	13	4
Home Arts	4	12	15	12	4
Science	2	5	8	5	2

Grade 9

	Band 1	Band 2	Band 3	Band 4	Band 5
Iowa Tests of Educational Development					
Understanding Basic Social Concepts	3	10	14	10	3
Background in the Natural Sciences	3	10	14	10	3
Correctness and Appropriateness of Expression	3	10	14	10	3
Ability to do Quantitative Thinking	4	11	15	11	4
General Vocabulary	2	7	9	7	2
Henmon-Nelson Test of Mental Ability	2	6	9	6	2
Kuder Preference Record Vocational Form CM (Boys)					
Outdoor	3	9	11	9	3
Mechanical	2	7	10	7	2
Computational	3	10	14	10	3
Science	3	9	11	9	3
Persuasive	6	10	14	10	6
Artistic	3	8	12	8	3
Literary	3	10	13	10	3
Musical	3	8	11	8	3
Social Service	4	10	14	10	4
Clerical	3	10	14	10	3

Percentile Equivalents of Standard Error of Measurement Within the Five Bands of Each Subtest

Grade 9 (Continued)

	Band 1	Band 2	Band 3	Band 4	Band 5
Kuder Preference Record Vocational Form CM (Girls)					
Outdoor	3	9	13	9	3
Mechanical	3	10	14	10	3
Computational	4	11	14	11	4
Science	4	9	12	9	4
Persuasive	4	11	15	11	4
Artistic	3	8	12	8	3
Literary	3	9	13	9	3
Musical	4	11	16	11	4
Social Service	3	10	14	10	3
Clerical	3	8	12	8	3

Grade 11

	Band 1	Band 2	Band 3	Band 4	Band 5
Iowa Tests of Educational Development					
Understanding Basic Social Concepts	3	9	13	9	3
Background in the Natural Sciences	3	10	13	10	3
Correctness and Appropriateness of Expression	3	10	13	10	3
Ability to do Quantitative Thinking	3	8	12	8	3
General Vocabulary	2	6	8	6	2
Henmon-Nelson Test of Mental Ability	2	7	10	7	2
Kuder Preference Record Vocational Form CM (Boys)					
Outdoor	3	9	11	9	3
Mechanical	2	7	10	7	2
Computational	3	10	14	10	3
Science	3	9	11	9	3
Persuasive	6	10	14	10	6
Artistic	3	8	12	8	3
Literary	3	10	13	10	3
Musical	3	8	11	8	3
Social Service	4	10	14	10	4
Clerical	3	10	14	10	3

2

Percentile Equivalents of Standard Error of Measurement Within the Five Bands of Each Subtest

Grade 11 (Continued)

	Band 1	Band 2	Band 3	Band 4	Band 5
Kuder Preference Record Vocational Form CM (Girls)					
Outdoor	3	9	13	9	3
Mechanical	3	10	14	10	3
Computational	4	11	14	11	4
Science	4	9	12	9	4
Persuasive	4	11	15	11	4
Artistic	3	8	12	8	3
Literary	3	9	13	9	3
Musical	4	11	16	11	4
Social Service	3	10	14	10	3
Clerical	3	8	12	8	3

Method for Determining Significant Differences Between Self-Estimates and Test-Estimates

It should be noted that the five bands to be used for interpreting test results are each divided into ten segments. Within these bands, the individual segments correspond to the following percentile equivalents:

Bands 1 and 5 -- 1 percentile point
Bands 2 and 4 -- 1.5 percentile points
Band 3 -- 5 percentile points

The following examples are presented to illustrate how to determine the significance of the difference between self-estimates and test-estimates. The scores are those of a ninth grade boy of above average ability and achievement who has a substantially accurate perception of his learning ability and achievement and a less accurate perception of his interests. When interpreting his test results, the following procedure would be followed to determine which of his self-estimates are significantly different from his percentile scores on the characteristics measured. (See next page for scores.)

Achievement

1. Understanding Basic Social Concepts. The student's estimate falls at the 70th percentile and his test score at the 65th percentile. Since 28 percentile points (14 from the test estimate and 14 from the self estimate) are required for a significant difference (see tables) within the middle band, this observed difference is not significant.

3. Correctness and Appropriateness of Expression. The student's estimate falls at the 85th percentile and his test score at the 96th percentile. Since 15 percentile points (10 from the student's estimate in band 4 and 3 from the test estimate in band 5) are required for a significant difference (see tables), chance may account for the difference observed.

Interests

2. Mechanical. The student's estimate falls at the 81th percentile and his test-estimate at the 42nd percentile. Since 39 percentile points separate the two estimates, and only 17 are required for a significant difference, this observed difference is clearly a significant one.

Test Interpretation Interview Form
Grades 9 and 11

Counselor______________________ Student's Name______________________

School______________________ Date______________________

I. Achievement

	Did very poorly	Didn't do as well as most	Did as well as most	Did better than most	Did very well
1. Understanding of Basic Social Concepts					
2. Background in the Natural Sciences					
3. Correctness and Appropriateness of Expression					
4. Ability to do Quantitative Thinking					
5. General Vocabulary					

II. Learning Ability

It's very Difficult	It's Difficult	Learn as Easily as most	It's Easy	It's very Easy

III. Interests

	Like it a lot less	Like it less	Like it as well as most	Like it more	Like it a lot more
1. Outdoor					
2. Mechanical					
3. Computational					
4. Scientific					
5. Persuasive					
6. Artistic					
7. Literary					
8. Musical					
9. Social Service					
10. Clerical					

Counselor Comments:

Non-test data which supplemented test scores
Affective reaction to information
Client wanted further session(s)
Other observations

The research studies reviewed earlier indicated that in most instances interpretations of tests failed to increase congruency between self-estimates and test-estimates for young clients. Such changes were shown with young clients in this study, as the investigators data will show in the next chapter. The original justification for using this approach seems to explain why positive results were obtained here:

1. It encouraged student participation in interpretation of test scores: (a) test materials were used to help each student recall what each part of each test was like before the student was required to estimate how well he did; (b) next the student was required to estimate how well he did on each part of each test; and (c) when a student's estimate was correct, it was either re-enforced or corrected soon after the student made his estimate.

2. The counselors who interpreted the tests were very carefully selected and prepared for their task. They were very sensitive to affect and proficient in dealing with it. They were able to detect cues which suggested that a student did not comprehend or accept the test results. Furthermore, the student was encouraged to react to test results -- to raise questions or to comment on how he felt about the way the test described him. The student was helped to say whatever he felt about the test results. Counselors seemed to accept the notion that helping each student examine his feelings about test results increased the chances for helping him to understand and to accept himself as he is.

3. The use of bands rather than either I.Q. or percentile ranks seemed to enhance communication of test results to students. It also seemed to help to take account of the student's reference group and to make a special effort to adapt the language used to this student's grade and maturity level.

4. It takes time to interpret test results in a meaningful way. In this instance the test interpretation interview averaged thirty minutes. Though students were not limited to thirty minutes, perhaps better results could be achieved with more leisurely interpretations.

5. With this focus on feelings, many students revealed that they had other problems that they wanted to discuss, and they were referred to the school counselor. This suggests that this approach can readily be perceived by students as a part of the regular counseling service.

6. With this careful instruction on the tests and what to say in interpreting the results, the counselors found that they were able to better concentrate on the student's feelings and to react to the feelings.

CHAPTER VI

Presentation of Results and Discussion

The data analysis is divided into three parts. Part 1 is limited to analyses of the effects of Orientation treatment upon (a) motivation for learning test results, (b) changes in accuracy of self-estimates following test interpretation, (c) the extent to which changes in accuracy are maintained on follow-up testing, and (d) the extent to which changes in accuracy occur from testing to follow-up self-rating.

Part 2 is concerned with analyses of the relationship of motivation for test interpretation to (a) changes in accuracy of self-estimates following test interpretation and (b) initial accuracy of self-estimates.

Part 3 is devoted to analyses of: (relationships independent of the main experimental variables) (a) the relationship of intelligence to accuracy of self-estimates, (b) the relationship of grade level to accuracy of self-estimates following test interpretation, (c) the effects of administering Orientation and Routine treatments within the same school, and (d) the extent to which satisfaction with actual self-estimates changes over occasions.

Part 4 presents analyses of: (a) changes in estimates of accuracy of self-ratings, (b) the relationship of estimates of accuracy of self-estimates to accuracy of self-ratings, and (c) the relationship of accuracy of self-estimates to type of treatment used.

Part 5 is limited to analyses of: (a) relationship of initial congruence between actual and ideal self-estimates to motivation for test interpretation, and (b) the relationship of initial congruence between actual and ideal self-estimates to changes in accuracy of self-estimates.

Before analysis of the data could be undertaken, it was necessary to define "accuracy" and devise a quantitative method for measuring it. Accuracy is defined to mean the extent of agreement between students' self-estimates and test-estimates on the test battery.

Rather than reporting accuracy measures for separate subtests of the test battery, it was decided to consider accuracy for the broad areas of achievement, intelligence, and interests. There were several reasons for this decision. First, since the reliability of self-estimates on certain scales was not significantly different from zero, considering such scales in separate analyses would not be meaningful. Second, the high intercorrelations among achievement subtests indicate that these scales are not independent measures. Third, examination of responses to the Self-Rating Scale and the Test Interpretation Interview Form revealed that students' self-ratings are not independent, i.e., those who rated themselves low on one subtest usually rated themselves low on others, and vice versa. Finally, interest, achievement, and intelligence are usually accepted as distinct areas for self-study.

Students' ratings of test characteristics were based on a five-point scale. The percentile scores earned on the subtests of the test battery were divided into five bands to correspond to the categories of the Self-Rating Scale. The divisions were:

Band 1 -- 90-99%
Band 2 -- 75-89%
Band 3 -- 25-74%
Band 4 -- 10-24%
Band 5 -- 0-9%

"Accuracy" is then determined in the following manner:

1. A student's rating on a particular subtest was compared with his test rating. For example, one student might have checked "Somewhat less than most students my age," for a rating of 4. His percentile score on the subtest, however, might have been 43, for a test rating of 3.

2. The difference between the student's self-rating and test-rating was computed. In this example: Self-rating (4) -- Test-rating (3) = 1

3. The numerical value, without respect to sign, was then subtracted from an arbitrarily assigned constant of 5.

4. The resulting scores were then summed across the five achievement subtests for an accuracy score for achievement and across the interest battery for the accuracy score for interests. The intelligence test yielded a single score.

The .05 level of significance was chosen as the level for rejection of null hypotheses. This study is of an exploratory nature, and the investigators are willing to take a five percent risk of a type-one error, i.e., rejection of a true null hypothesis. This consideration was further based on the fact that practical application of subsequent findings of this study should be made with caution or withheld until they can be replicated by other investigations.

1. Effects of Orientation

Analysis of Effects of Orientation Upon Motivation

The first analysis was designed to determine whether the Orientation and Routine groups were distributed comparably with respect to requests for test interpretation interviews. Comparability was defined to mean that distributions of students' Counseling Request categories were essentially similar between Orientation and Routine groups. It was hypothesised that a greater proportion of the Orientation groups would request test interpretation.

The analysis was conducted by first categorizing students' responses to the Counseling Request Form in terms of two categories: requests for test interpretation and requests not to participate in test interpretation. A chi-square test and two-by-two contingency tables were used to test the independence of these proportions between Orientation and Routine groups. One test was run for each of the four grade levels. Table IV contains the obtained chi-square values.

Results

Two of the obtained chi-square values were significant. The statistical hypothesis was rejected for grades seven and nine and accepted for grades five and eleven. On the basis of these results, it appears that the Orientation treatment results in greater motivation for learning test results in grades seven and nine but not in grades five and eleven.

TABLE IV

Tests of Comparability of Proportions Distributed Between Counseling Request Form Categories of Orientation and Routine Groups

Grade	χ^2	Probability
5	3.38	$>.05$
7	22.19*	$<.001$
9	5.09*	$<.05$
11	3.48	$>.05$

Discussion

While no adequate explanation can be given for these findings on the basis of available data, some tentative reasons might be proposed. Students at fifth grade level may have not yet begun to formulate questions about their interests and abilities as described in the Orientation presentation. In offering an explanation for the observed difference in motivation between fifth and seventh graders, readiness may be a major factor. Seventh graders, being two years older, may have begun to seriously ask questions about themselves which they believe, as a result of Orientation, that tests may help them to answer. It is likely that seventh graders are anticipating high school and questioning their ability to succeed. Also, the onset of pubescence, with its concomitant problems, may have raised questions about self which are reflected in increased motivation for test interpretation in the Orientation group.

In case of ninth graders, recent enrollment in the high school curriculum may have raised questions about abilities and interests which the Orientation presentation implied would be answered through test interpretation. Eleventh graders, however, may be more secure in their ability to do high school work, as well as attempting to appear more sophisticated with respect to testing. It would seem, however, that anticipation of college or employment following graduation might have resulted in higher motivation under the Orientation treatment

While it offers no explanation for the apparent differences in motivation between treatment groups with respect to grades five and eleven, it should be noted that there appears to be distinct differences among grade levels in terms of motivation for test interpretation. Considering the entire sample, 76.40% of fifth graders, 77.21% of seventh graders, 92.94% of ninth graders, and 87.20% of eleventh graders requested test interpretation interviews. The chi-square of 92.80 with three degrees of freedom computed on these data was significant beyond the .001 level. Since different proportions of students in the total grades five and eleven requested test interpretation, consideration of the base rate problem involved suggests that the failure of Orientation to produce greater motivation may not mean the same for both grades.

Effects of Orientation Upon Accuracy of Self-Estimates

This analysis was designed to determine the extent to which Orientation resulted in greater accuracy of self-perceptions following test interpretation. It was hypothesized that a positive relationship existed between Orientation and accuracy of self-estimates following test interpretation.

The hypothesis that the population correlation is zero was tested by first subtracting accuracy scores derived from SR-2* and from the accuracy scores from SR-3. The resulting numbers were then categorized in terms of Orientation or Routine groups. The relationship between changes in accuracy and treatment group was then tested using the point-biserial correlation technique (Walker and Lev, 1953, 262).

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*There were four self-rating occasions:
SR-1 was made before testing.
SR-2 was made following testing.
SR-3 was made following test interpretations.
SR-4 was made after a two-month following period

Both the point-biserial and the biserial correlation coefficients were considered for this analysis, but the point-biserial was chosen over the biserial for the following reasons: First, the data on level of motivation for test interpretation were gathered dichotomously, and while it can be argued that motivation for test interpretation is ultimately a continuously distributed variable and that it might be well for counselors to know the relative motivation of students requesting interpretations, the fact is that students either do or do not volunteer for test interpretation when presented with an opportunity to do so, and the purpose of this investigation was to investigate the variable of motivation as a dichotomous variable. Second, the point-biserial correlation coefficient was used because no satisfactory tests of significance have been developed for r_{bis} except under circumstances where N is large, $P = Q = .5$, and where r_{bis} is not close to $+1$ or -1. Available data strongly indicated that P and Q were not equal, and prior to computation, no knowledge of r_{bis} was available. Since the numerical values which can be obtained from the r_{bis} coefficient are theoretically unlimited in the positive and negative direction, interpretation of r_{bis} could have been quite difficult.

It was necessary to compute correlations separately for each grade level and for achievement, intelligence, and interest accuracy scores within each grade level. The significance of the obtained coefficients weas tested by computing t-values for each value of r_{pb} (Walker and Lev, 1953, 265). Table IV presents the obtained values of the point-biserial correlation coefficient.

Results

The correlation coefficients obtained in Table V provide no evidence of relationship between the kind of treatment used and changes in accuracy of self-estimates of achievement, intelligence, and interests following test interpretation. The statistical hypothesis was accepted.

TABLE V

Relationship of Orientation to Accuracy of Self-Estimates

Grade	Type of Test	r_{pb}	Probability
5	Achievement	.025	>.05
	Intelligence	.041	>.05
	Interests	-.083	>.05
7	Achievement	.022	>.05
	Intelligence	-.108	>.05
	Interests	-.018	>.05
9	Achievement	.113	>.05
	Intelligence	.081	>.05
	Interests	-.013	>.05
11	Achievement	.074	>.05
	Intelligence	.070	>.05
	Interests	.009	>.05

Discussion

On the basis of these results, it was concluded that the Orientation treatment, as used with this population, does nothing to induce increased accuracy of student self-estimates of their measured achievement, intelligence, and interests following test interpretation.

This finding made possible a more straightforward analysis of the changes in accuracy of self-estimates from SR-2 to SR-3. Since the treatment was not related to changes in accuracy of self-estimates, both treatment groups were combined for these analyses.

The Extent to Which Self-Estimates Change

This analysis was designed to ascertain the extent to which students' estimates of performance on achievement, intelligence, and interest tests become more accurate following test interpretation. The hypothesis was that mean accuracy scores would be greater following test interpretation than after testing.

The hypothesis that the means on the two occasions are equal was tested by computing t-tests (Walker and Lev, 1953, 154) for the significance of the differences between mean accuracy scores for SR-2 and SR-3. Separate t-tests were computed for each type of test within each grade level.

Results

The t-values presented in Table VI indicate that significant increases in accuracy of self-estimates occurred following test interpretation. This occurred for each type of test within each of the four grade levels. The statistical hypothesis was rejected.

TABLE VI

Changes in Accuracy of Self-Estimates from SR-2 to SR-3

Grade	Type of Test	t	Probability
5	Achievement	5.56*	<.001
	Intelligence	7.43*	<.001
	Interests	6.29*	<.001
7	Achievement	13.01*	<.001
	Intelligence	5.36*	<.001
	Interests	7.99*	<.001
9	Achievement	13.34*	<.001
	Intelligence	8.68*	<.001
	Interests	10.45*	<.001
11	Achievement	5.73*	<.001
	Intelligence	3.62*	<.001
	Interests	8.53*	<.001

Discussion

These results present convincing evidence of the increased accuracy of self-estimates following test interpretation. The obtained valued of "t" indicate extremely small probability that the observed changes are due to chance factors.

It is especially encouraging to note that significant changes in accuracy occurred at all grade levels for all types of tests interpreted. This finding lends support to the use of test interpretation at the elementary and junior high school levels. It appears that students at all grade levels are able to improve the accuracy of their estimates through test interpretation.

While the Orientation treatment was unrelated to changes in accuracy of self-estimates following test interpretation, it is quite possible that counselor response to student affect was a significant variable in producing change at all grade levels. Most of the studies reviewed have not attempted to elicit and respond to students' feelings about their test results. The extent to which this variable is related to these observed changes in accuracy of self-estimates cannot be determined from these data; however, it offers a logical explanation for these results. Obviously, the effect of responding to affect must be tested with new data.

The Extent to Which Changes in Accuracy are Maintained on Follow-up Testing

This analysis was conducted to determine the extent to which cahanges in accuracy following test interpretation were maintained over a two-month follow-up period. It was hypothesized that no significant changes in accuracy of self-estimates occurred between test interpretation and the two-month follow-up self-report. The expectation was acceptance.

The hypothesis of zero difference was tested by first computing for each individual the difference between the accuracy scores made following test interpretation and those made following the two-month follow-up period. The significance of this difference was then tested with the t-statistic (Walker and Lev, 1953, 154).

Separate t-tests were computed for accuracy scores on achievement, intelligence, and interests for each grade level.

Results

The t-values presented in Table VII provide sufficient evidence for rejection of the statistical hypothesis. These results provide strong evidence of a significant decrease in accuracy of self-estimates during the two-month period which elapsed between test interpretation and follow-up administration of the self-rating devices.

Table VII

Changes in Accuracy of Self-Estimates from SR-3 to SR-4

Grade	Type of Test	t	Probability
5	Achievement	2.42*	$<.02$
	Intelligence	.73	$>.05$
	Interests	4.23*	$<.001$
7	Achievement	6.47*	$<.001$
	Intelligence	3.08*	$<.01$
	Interests	1.51	$>.05$
9	Achievement	3.16*	$<.02$
	Intelligence	4.45*	$<.001$
	Interests	8.32*	$<.001$
11	Achievement	3.67*	$<.001$
	Intelligence	2.28*	$<.02$
	Interests	4.39*	$<.001$

Discussion

From these results, one must conclude that the gains in accuracy of self-estimates following test interpretation are not maintained over a substantial length of time. Only two of the twelve values of t were not significant in the direction indicating a decrease in accuracy of self-estimates. It is evident, therefore, that without continued experiences designed to promote self-evaluation and/or provide information about one's self gains in self accuracy resulting from test interpretation are not maintained.

The Extent to Which Changes in Accuracy Occur from SR-2 to SR-4

The previous analysis revealed a substantial decrease in accuracy of self-estimates during the period which elapsed between test interpretation and follow-up rating two months later. However, the possibility still remains that substantial increases in accuracy of self-estimates may have occurred between self-rating 2 and self-rating 4. This analysis, therefore, was conducted to determine the extent to which changes in accuracy of self-estimates occurred over the total length of time covered by this investigation. The hypothesis was that no significant difference existed between accuracy of self-estimates following testing and after a two-month follow -up period. The expectation was that the data will provide sufficient evidence for rejection of the statistical hypothesis.

Results

The t-values presented in Table VIII provide sufficient evidence for rejection of the statistical hypothesis. These results indicate that significant increases in accuracy of self-estimates occurred during the period between test administration and follow-up rating.

Table VIII

Changes in Accuracy of Self-Estimates from SR-2 to SR-4

Grade	Type of Test	t	Probability
5	Achievement	3.70****	<.001
	Intelligence	2.87***	<.01
	Interests	1.96*	<.05

Table VIII (continued)

Changes in Accuracy of Self-Estimates from SR-2 to SR-4

Grade	Type of Test	t	Probability
7	Achievement	6.70****	$<.001$
	Intelligence	2.39**	$<.02$
	Interests	3.23***	$<.01$
9	Achievement	4.01 ****	$<.001$
	Intelligence	4.50 ****	$<.001$
	Interests	-.025	$>.05$
11	Achievement	1.84	$>.05$
	Intelligence	1.16	$>.05$
	Interests	4.13****	$<.001$

Discussion

These results suggest that, in spite of a significant decrease between test interpretation and follow-up testing, students' accuracy of self-estimates are significantly more accurate at the end of the follow-up period than they were following testing. It cannot be determined from these results whether over a longer period these differences would be maintained. The decrease in accuracy of self-estimates over this period resembles a learning curve. Furthermore, it cannot be determined from these results the extent to which real acceptance and integration of information about self occurred. The results do suggest that with intervening experiences designed to reinforce the information presented in test interpretation, with encouragement for students to continue to ask questions about themselves, and with reasons for them to engage in reality testing, the increase in accuracy of self-estimates could be maintained over a very substantial period of time.

2. Effects of Motivation

Relationship of Motivation to Changes in Accuracy of Self-Estimates

This analysis was designed to determine whether changes in accuracy of self-estimates following test interpretation are related to motivation for learning test results. It was expected that a positive relationship would be found between motivation and changes in accuracy of self-estimates.

The hypothesis of zero correlation was tested by first subtracting accuracy scores derived from SR-2 and from the accuracy scores from SR-3. The resulting numbers were then categorized in terms of students' responses to the Counseling Request Form: requests for test interpretation interviews and requests not to participate in test interpretation. The relationship between changes in accuracy and motivation category was then tested using the previously described point-biserial correlation technique.

It was necessary to compute correlations separately for each grade level and for achievement, intelligence, and interest accuracy scores within each grade level.

Results

The r_{pb} correlation coefficients contained in Table IX were tested for significance by computing t-tests (Walker and Lev, 1953, 265) for each value of r_{pb}. The statistical hypothesis was accepted for grades five and eleven. Significant relationships were found between motivation and accuracy of self-estimates of achievement and interests in grade seven, and achievement in grade nine.

TABLE IX

Relationship of Motivation to Changes in Accuracy of Self-Estimates

Grade	Type of Test	r_{pb}	Probability
5	Achievement	.067	$>.05$
	Intelligence	.038	$>.05$
	Interests	.038	$>.05$
7	Achievement	.183*	$<.02$
	Intelligence	.088	$>.05$
	Interests	.167*	$<.02$
9	Achievement	.242*	$<.001$
	Intelligence	.013	$>.05$
	Interests	-.068	$>.05$
11	Achievement	.065	$>.05$
	Intelligence	.051	$>.05$
	Interests	-.060	$>.05$

Discussion

These findings provide only limited evidence of a relationship between motivation for learning test results and changes in accuracy of self-estimates following test interpretation. While these results generally indicated no relationship, the significant values of r_{pb} indicate that the relationship between motivation and changes in accuracy is not zero.

Why these relationships exist for grades seven and nine and not for grades five and eleven cannot be answered from these data. Likewise, it is difficult to explain why the relation failed to exist between motivation and changes in accuracy of self-estimates of intelligence.

The Relationship Between Initial Accuracy of Self-Estimates and Motivation

This analysis was designed to determine whether any significant relationship existed between initial accuracy of self-estimates and motivation for learning the results of the test battery. It was hypothesized that a negative relationship existed between motivation and initial accuracy of self-estimates.

The hypothesis of zero relationship was tested by first computing the accuracy scores on achievement, learning ability, and interest for SR-1. The resulting accuracy scores were then categorized in terms of students' response to the Counseling Request Form: requests for interpretation and requests not to participate in test interpretation. The relationship between initial accuracy and motivation category was then tested using the point-biserial correlation technique.

Using the .05 level of significance, correlations were computed separately for each grade on achievement, intelligence, and interests. The significance of the correlation coefficients presented in Table X were tested with the t-test (Walker and Lev, 1953, 256).

Results

These correlation coefficients provide no evidence of relationship between motivation for test interpretation and initial accuracy of self-estimates of achievement, intelligence, and interests. The statistical hypothesis was accepted.

TABLE X

Relationship of Initial Accuracy of Self-Estimates to Motivation

Grade	Type of Test	r_{pb}	Probability
5	Achievement	-.074	$>.05$
	Intelligence	-.100	$>.05$
	Interests	-.018	$>.05$
7	Achievement	-.012	$>.05$
	Intelligence	.036	$>.05$
	Interests	.108	$>.05$
9	Achievement	.094	$>.05$
	Intelligence	.070	$>.05$
	Interests	-.078	$>.05$

TABLE X (continued)

Relationship of Initial Accuracy of Self-Estimates to Motivation

Grade	Type of Test	r_{pb}	Probability
11	Achievement	-.037	$>.05$
	Intelligence	.186	$>.05$
	Interests	.065	$>.05$

Discussion

Within the limitations of this study, students' initial accuracy of self-estimates of achievement, intelligence, and interests seem unrelated to their motivation for discussing test scores with a counselor. These findings suggest that factors other than accuracy of self-estimates are related to motivation for learning test results.

From these data one cannot isolate the factors which influence motivation for test interpretation; however, the finding that accuracy of self-estimates is not one of these factors suggests that more important, perhaps, are students' feelings about these estimates. "As well as most my age" may be an optimistic estimate for a student of borderline intelligence, but an expression of inadequacy for a student of superior ability. Both estimates are equally "accurage," but may be qualitatively different when related to motivation for learning test results. Within this example, the first student might be quite eager to find out how he performed, whereas the student whose estimate was an expression of inadequacy might view an interview with a counselor as an opportunity to "learn the worst about himself."

3. Other Characteristics Related to Accuracy of Self-Estimates

Relationship of Intelligence to Accuracy of Self-Estimates

This analysis was undertaken to determine the extent to which intelligence was related to accuracy of self-estimates on the three self-rating occasions. It was predicted that a significant relationship existed between intelligence and accuracy of self-estimates.

The hypothesis of zero correlation was tested by first computing the accuracy scores as described on page 59. The students' test bands were noted, and a Pearson product-moment correlation coefficient was computed using accuracy scores and test band for intelligence for each individual.

It was necessary to compute separate coefficients for the areas of achievement, intelligence, and interests for each of the four grade levels. Table XI contains the obtained correlation coefficients.

Results

These values of r provide sufficient evidence for rejection of the statistical hypothesis. The direction of the significant values of r indicates a positive relationship between students' intelligence and the accuracy of their self-estimates of achievement and intelligence. Of the six values indicating a relationship between measured intelligence and achievement, all were in the positive direction. Of the eight values indicating a relationship between measured intelligence and the accuracy of self-estimates of intelligence, seven were in the positive direction. The obtained results suggest a negative relationship between students' measured intelligence and the accuracy of their self-estimates of interests. The four values indicating a relationship between measured intelligence and accuracy of self-estimates were all negative.

TABLE XI

Relationship of Accuracy of Self-Estimates to Intelligence

Grade	Occasion	Type of Test	r	Probability
5	1	Achievement	.167*	<.02
		Intelligence	.205*	<.01
		Interests	-.180*	<.02
	2	Achievement	.041	>.05
		Intelligence	.120	>.05
		Interests	-.250*	<.001
	3	Achievement	-.053	>.05
		Intelligence	-.001	>.05
		Interests	-.096	>.05
7	1	Achievement	.160*	<.05
		Intelligence	.127	>.05
		Interests	-.233*	<.001
	2	Achievement	.099	>.05
		Intelligence	.003	>.05
		Interests	-.176*	<.02
	3	Achievement	-.044	>.05
		Intelligence	-.153*	<.05
		Interests	-.095	>.05
9	1	Achievement	.388*	<.001
		Intelligence	.506*	<.001
		Interests	.060	>.05
	2	Achievement	.439*	<.001
		Intelligence	.520*	<.001
		Interests	.014	>.05
	3	Achievement	.127*	<.05
		Intelligence	.209*	<.01
		Interests	.072	>.05
11	1	Achievement	.155	>.05
		Intelligence	.274*	<.001
		Interests	.026	>.05
	2	Achievement	.210*	<.02
		Intelligence	.388*	<.001
		Interests	.118	>.05
	3	Achievement	.153	>.05
		Intelligence	.165*	<.05
		Interests	.131	>.05

Discussion

The evidence of a relationship between measured intelligence and the accuracy of self-estimates of intelligence and achievement is consistent with previous research. Arsenian (1942) and Froelich and Moser (1954) reported that more accurate self-estimates were made by brighter students. Further support for this relationship is found in the research of Schulman (1956) and O'Hara and Tiedeman (1959) who found that as students grew older they increased in the ability to accurately estimate their measured achievement and interests.

The finding of a negative relationship between measured intelligence and accuracy of estimated interests is inconsistent with the results reported by Crosby and Windsor (1941) who found that brighter students made fewer errors in estimating their interests as measured by the Kuder. Crosby and Windsor used college sophmores as subjects, whereas this study used subjects of a much younger age. While the data of this study cannot provide an explanation for these findings, it is interesting to note in this connection that this negative relationship was not found below grade seven. It is possible that brighter students have wider interests and are, consequently, less certain about their relative prominence as measured by standardized interest inventories.

The finding of a positive relationship between measured intelligence and accuracy of self-estimates of achievement and intelligence suggests that counselors might give added attention to interpreting the scores of the less intelligent students. The current practice tends to emphasize interpreting scores to brighter students: those who are college-bound, or the bright under-achiever. These results would suggest that of the two mental ability groups, the brighter students already possess the more accurate self-estimates of their achievement and intelligence.

A word of caution should be added, however, stressing the difference between findings of theoretical value and those of practical value. The values of r obtained in this analysis are sufficiently large to reject the hypothesis of no relationship between intelligence and accuracy of self-estimates within the population from which this sample was drawn; however, few of these values account for enough variation to make a practical difference. It is possible that non-reliability of the measures, as well as unknown sources of error, may have lowered the efficiency of these estimates of the population correlations. The practical significance of this finding, therefore, may be determined by the degree to which more precise measures of this relationship can be constructed, as well as the use of other relevant test and non-test data about students.

Relationship of Grade Level to Accuracy of Self-Estimates

The purpose of this analysis was to determine whether maturity, as represented by grade level, was significantly related to changes in accuracy following test interpretation interviews. It was hypothesized that greater mean changes in accuracy occurred in grades nine and eleven.

The hypothesis of equal means was tested by first finding the differences between the accuracy scores on SR-2 and SR-3 for each individual. Then mean accuracy scores for grades were compared using a one-way analysis of variance design. Because different test batteries were administered to grades five and seven and nine and eleven, the data were analyzed separately within fifth and seventh grades and within ninth and eleventh grades.

Results

Examination of Table XII indicates that the statistical hypothesis of no difference among grade levels in mean changes in accuracy of self-estimates following test interpretation must be accepted except for changes on achievement estimates for grades nine and eleven. Examination of the means reveals a mean accuracy change of 1.52 (possible range of accuracy scores in 20 points) for grade nine and .88 for grade eleven.

TABLE XII

Analysis of Variance for Comparing Mean Changes in Accuracy Scores Following Test Interpretation

Grade	Type of Test	F	Probability
5 & 7	Achievement	1.00	$>.05$
	Intelligence	1.03	$>.05$
	Interests	.0079	$>.05$
9 & 11	Achievement	4.14*	$<.05$
	Intelligence	2.09	$>.05$
	Interests	1.28	$>.05$

Discussion

Except for the possibility of sampling error, it is difficult to explain the difference between grades nine and eleven in the absence of such changes for grades five and seven. The apparent greater change in accuracy of achievement estimates made by ninth graders may have resulted from a greater need on the part of ninth graders to find some objective basis for estimating their high school performance or from higher initial accuracy of eleventh graders. There was a .8892 mean difference in accuracy of achievement estimates favoring eleventh grade on SR-2.

The Effects of Administering Orientation and Routine Treatments Within the Same School

This analysis was undertaken to determine the extent to which administering both treatments within the same school resulted in similar motivation for test interpretation and outcomes of test interpretation.

This analysis was carried out by asking students in the Routine group within each grade the following question at the completion of the test battery: "Did anyone from the other group talk with you about what they learned about testing or about what one can learn from tests?" Students were requested to write "yes" or "no" on the Counseling Request Form.

Only 3% of the total group responded that members of the Orientation treatment had talked with them. On this basis, it was concluded that a significant amount of discussion about the procedure had not taken place, and the students in this school were included with the larger sample for the rest of the data analysis.

The Extent to Which Satisfaction With Actual Self-Estimates Change Over Occasions

This analysis was designed to determine whether expressed satisfaction with actual self-estimates changed over four occasions: first, second, third, and fourth self-ratings. It was predicted that no significant differences existed in mean satisfaction ratings over four self-rating occasions. It was predicted that the data will provide evidence for rejection of this hypothesis.

This hypothesis of equal means was tested by a one-way analysis of variance design comparing the mean satisfaction scores between the four self-rating occasions. The analysis was conducted separately for types of test and grade levels.

Results

The F-values presented in Table XIIIprovide evidence for rejection of the statistical hypothesis for grade 7, 9 and 11. These results indicated that students in grade 7 become increasingly satisfied with their self-estimates of intelligence over four self-rating occasions. The same relationship was observed for self-estimates of achievement and intelligence for ninth grade and for self-estimates of achievement, intelligence and interests in eleventh grade.

TABLE XIII

Relationship Between Students' Estimates and Satisfaction With Actual Self-Estimates Over Occasions

Grade	Type of Test	F	Probability
5	Achievement	.329	>.05
	Intelligence	.414	>.05
	Interests	1.66	>.05
7	Achievement	.340	>.05
	Intelligence	9.03*	<.01
	Interests	2.02	>.05
9	Achievement	6.61*	<.01
	Intelligence	2.98*	<.05
	Interests	.667	>.05
11	Achievement	2.76*	<.05
	Intelligence	6.81*	<.01
	Interests	11.52*	<.01

Discussion

As noted in the section on the limitations of this study, it is impossible to differentiate between recall and acceptance of test information; however, it might be inferred from these results that a significant degree of acceptance of test information does occur over the four self-rating occasions. Examination of the obtained F-values reveals that this relationship becomes increasingly apparent from grades five through eleven. In other words, one can infer that the more mature students become more satisfied with their self-estimates when given an opportunity to make repeated self-evaluations. Torrance's findings also support this inference. Added support for this assumption is provided by the fact that eleventh grade contained the smallest number of cases, thus making it more difficult to obtain a larger F-value.

4. Estimates of Accuracy of Self-Ratings

Extent to Which Student Estimates of the Accuracy of Self-Ratings Change Over Occasions

On each self-rating occasion, students were asked to estimate the accuracy of their self-ratings of achievement, intelligence, and interests. This analysis was conducted to determine whether systematic changes in estimated accuracy of self-estimates of achievement, intelligence, and interests occur over four occasions: first, second, third, and fourth self-ratings. It was predicted that estimates of the accuracy of self-ratings were distributed independently of the self-rating occasions. It was predicted that this hypothesis would be rejected.

The analysis was carried out by categorizing students' estimates of accuracy within five categories (from "I know almost exactly how I compare with others my age" to "I have no idea how I compare with others my age") according to the four self-rating occasions. The independence of these distributions was then tested using a four-by-five contingency table and a chi-square test of significance with twelve degrees of freedom. Separate values of chi-square were computed for estimates of accuracy on achievement, intelligence, and interests for each grade level.

Results

The chi-square values reported in Table XIV provide evidence for the rejection of the statistical hypothesis. On the basis of these findings it is concluded that students believed the accuracy of their self-estimates of achievement and intelligence increases over four self-rating occasions. No such relationship was observed for estimates of accuracy of self-estimates of interests.

TABLE XIV

Extent of Changes in Estimated Accuracy of Self-Estimates

Grade	Type of Test	χ^2	Probability
5	Achievement	26.22*	$<.01$
	Intelligence	15.68	$>.05$
	Interests	9.41	$>.05$
7	Achievement	24.66*	$<.02$
	Intelligence	22.66*	$<.05$
	Interests	12.21	$>.05$
9	Achievement	66.92*	$<.001$
	Intelligence	69.19*	$<.001$
	Interests	9.22	$>.05$
11	Achievement	36.36*	$<.001$
	Intelligence	43.30*	$<.001$
	Interests	13.10	$>.05$

Discussion

These findings are consistent with our expectations. It is encouraging to note that not only does accuracy of self-estimates increase, but that students are aware that this does occur. The finding that students do not believe the accuracy of their estimates of interests increases over the self-rating occasions suggests that, while such increases do in fact occur, students are apparently less certain about the results of interest tests. This may represent more difficulty in perceiving one's likes and dislikes as opposed to one's achievement and intelligence, or it may simply represent a more difficult learning task, considering that elementary and secondary interest tests contained eight and ten subtests, respectively.

Relationship of Estimated Accuracy of Self-Ratings to Measured Accuracy of Self-Ratings

This analysis was designed to examine the extent to which students' estimates of the accuracy of their self-estimates of achievement, intelligence, and interests were related to the measured accuracy of their self-estimates. It was hypothesized that no significant relationship existed between estimated and measured self-estimates. It was predicted that this hypothesis would be rejected.

The hypothesis of zero correlation was tested by computing Pearson product-moment correlation coefficients between the estimated accuracy scores and the measured accuracy scores. Separate coefficients were computed for each type of test and each rating occasion within each of the four grade levels.

Results

The values of r presented in Table XV provide no support for rejecting the null hypothesis of no relationship between estimated and measured accuracy of self-estimates of achievement, intelligence, and interests.

TABLE XV

Relationship Between Estimated and Measured Self-Estimates

Grade	Occasion	Type of Test	r	Probability
5	1	Achievement	.053	>.05
		Intelligence	.050	>.05
		Interests	.039	>.05
	2	Achievement	.037	>.05
		Intelligence	-.071	>.05
		Interests	-.032	>.05
	3	Achievement	-.025	>.05
		Intelligence	.049	>.05
		Interests	.095	>.05

TABLE XV (continued)

Relationship Between Estimated and Measured Self-Estimates

Grade	Occasion	Type of Test	r	Probability
	4	Achievement	-.123	>.05
		Intelligence	.011	>.05
		Interests	-.043	>.05
7	1	Achievement	.049	>.05
		Intelligence	-.063	>.05
		Interests	-.057	>.05
	2	Achievement	.096	>.05
		Intelligence	.072	>.05
		Interests	-.069	>.05
	3	Achievement	-.016	>.05
		Intelligence	.068	>.05
		Interests	-.005	>.05
	4	Achievement	.011	>.05
		Intelligence	-.085	>.05
		Interests	.193	>.05
9	1	Achievement	-.041	>.05
		Intelligence	-.039	>.05
		Interests	-.183*	<.01
	2	Achievement	.019	>.05
		Intelligence	.083	>.05
		Interests	-.021	>.05
	3	Achievement	-.015	>.05
		Intelligence	.018	>.05
		Interests	-.048	>.05
	4	Achievement	-.168*	<.01
		Intelligence	-.024	>.05
		Interests	.150*	<.05
11	1	Achievement	.038	>.05
		Intelligence	-.050	>.05
		Interests	-.098	>.05
	2	Achievement	.084	>.05
		Intelligence	.048	>.05
		Interests	.009	>.05

TABLE XV (continued)

Relationship Between Estimated and Measured Self-Estimates

Grade	Occasion	Type of Test	r	Probability
	3	Achievement	-.064	>.05
		Intelligence	-.113	>.05
		Interests	.122	>.05
	4	Achievement	.001	>.05
		Intelligence	.055	>.05
		Interests	.079	>.05

Discussion

These results appear rather inconsistent with the previously reported findings that students' self-estimates become more accurate following test interpretation and that students perceive that this increase in accuracy does occur. However, this analysis examined specifically the relationship between estimates of accuracy and measured accuracy. While these students, as a group, believe that self-estimates become more accurate, they are apparently unable to determine which of their estimates become more accurate. It seems, then, that students perceive that, on the whole, their estimates are becoming more accurate, but that they are unable to accurately predict which of their estimates are changing in this direction.

Extent to Which Estimates of the Accuracy of Self-Estimates Are Related to Treatment

This analysis was undertaken to determine whether estimates of accuracy of ratings were related to type of treatment applied. It was predicted that estimates of the accuracy of self-ratings over occasions were distributed independently of the type of treatment applied. It is predicted that this hypothesis would be rejected.

The analysis was conducted by categorizing students' estimates of accuracy within the five categories according to Orientation and Routine treatments. The independence of these distributions was tested using two-by-five contingency tables and a chi-square test of significance with four degrees of freedom. Separate values of chi-square were computed for each type of test on each occasion within each grade level.

Results

The values of chi-square presented in Table XVI provide partial evidence for rejection of the statistical hypothesis. On the basis of these results it appears that Orientation is positively related to estimates of accuracy of self-ratings. This relationship appeared at all grade levels. All but one of the seven significant values of chi-square were found for estimates of accuracy made following test interpretation. Four of the seven significant values were for estimates of accuracy of intelligence.

TABLE XVI

Relationship Between Accuracy of Self-Estimates and Treatment

Grade	Occasion	Type of Test	χ^2	Probability
5	1	Achievement	6.72	$>.05$
		Intelligence	7.77	$>.05$
		Interests	5.04	$>.05$
	2	Achievement	4.46	$>.05$
		Intelligence	1.90	$>.05$
		Interests	6.08	$>.05$
	3	Achievement	.87	$>.05$
		Intelligence	33.22*	$<.001$
		Interests	6.14	$>.05$

TABLE XVI (continued)

Relationship Between Accuracy of Self-Estimates and Treatment

Grade	Occasion	Type of Test	χ^2	Probability
	4	Achievement	7.62	$>.05$
		Intelligence	27.61*	$<.001$
		Interests	4.85	$>.05$
7	1	Achievement	8.21	$>.05$
		Intelligence	3.62	$>.05$
		Interests	4.18	$>.05$
	2	Achievement	3.89	$>.05$
		Intelligence	1.13	$>.05$
		Interests	4.22	$>.05$
	3	Achievement	3.50	$>.05$
		Intelligence	.58	$>.05$
		Interests	7.87	$>.05$
	4	Achievement	44.09*	$<.01$
		Intelligence	1.47	$>.05$
		Interests	2.45	$>.05$
9	1	Achievement	.70	$>.05$
		Intelligence	3.10	$>.05$
		Interests	2.72	$>.05$
	2	Achievement	.78	$>.05$
		Intelligence	2.70	$>.05$
		Interests	7.62	$>.05$
	3	Achievement	1.86	$>.05$
		Intelligence	49.69*	$<.001$
		Interests	5.26	$>.05$
	4	Achievement	.36	$>.05$
		Intelligence	.90	$>.05$
		Interests	6.26	$>.05$
11	1	Achievement	4.47	$>.05$
		Intelligence	6.87	$>.05$
		Interests	.04	$>.05$
	2	Achievement	1.16	$>.05$
		Intelligence	0.00	$>.05$
		Interests	[illegible]	$>.05$

TABLE XVI (continued)

Relationship Between Accuracy of Self-Estimates and Treatment

Grade	Occasion	Type of Test	χ^2	Probability
	3	Achievement	21.87*	$< .001$
		Intelligence	23.83*	$< .001$
		Interests	21.90*	$< .001$
	4	Achievement	1.27	$> .05$
		Intelligence	5.93	$> .05$
		Interests	.33	$> .05$

Discussion

While these findings are not conclusive, they do present interesting questions for further investigation. The finding that Orientation treatment is positively associated with estimates of accuracy following test interpretation might mean that the Orientation treatment has little effect upon estimates of accuracy prior to meeting a counselor for test interpretation. It could be that the Orientation treatment introduces an expectation for learning about self and that students believed that this had in fact occurred following their interviews with the counselor. The finding that most of the significant values were for intelligence presents the possibility that of the three types of tests administered in this study, students were most eager to learn about these results.

5. Initial Agreement Between Actual and Ideal Self-Estimates

Relationship of Initial Congruence Between Actual and Ideal Self-Estimates to Motivation for Test Interpretation.

Before the relationship of the congruence of actual and ideal self estimates to motivation could be ascertained, it was necessary to define "congruence" and devise a quantitative method for measuring it.

Congruence of self estimates was defined as the extent to which students' actual self-estimates and ideal self-estimates agreed.

The congruence scores were obtained in a manner similar to the way in which accuracy scores were determined. As in the previous instance, these congruence scores were single numerical values for achievement, intelligence, and interests. The same reasons for reporting congruence scores for broad test areas rather than for specific subtests apply here too. First, there is the problem of low reliability, mentioned earlier (see p. 58). Since congruency between self-estimates on discrete subtests are themselves unreliable, it is not meaningful to use them and use of them could lead to spurious results, and invalid conclusions and generalizations. Second, the actual and ideal self-estimates appeared highly correlated; although "ideal" ratings were higher (students checking category 3 on "actual" generally checked 2 on "ideal"). Third, an examination of the Self-Rating Scales suggested that students ideal self-estimates represented a general level of self-estimation rather than specific estimates on each sub-test of the test battery.

Congruence scores were obtained in the following manner:

1. Actual and ideal self estimates were compared for each subtest. For example, an actual self estimate might have been "About the same as most students my age (3)," while the ideal self estimate might have been "Somewhat more than

most students my age (2)." Actual Self-estimate (3) --Ideal Self-estimate (2) = 1.

2. The obtained numerical value, without respect to sign, was then subtracted from an arbitrarily assigned constant of 5.

3. The resulting scores were then summed across the achievement subtests for a congruence score for achievement and across the interest subtests for the congruence score for interests. The intelligence test yielded a single score.

It was predicted that no significant relationship existed between motivation for test interpretation and congruence of self-estimates. It was expected that this hypothesis would be rejected.

The hypothesis of zero correlation was tested by first computing the congruence scores on achievement, intelligence, and interests for SR-1. The resulting congruence scores were then categorized in terms of students' final responses to the Counseling Request Form: requests for interpretation or requests not to participate in test interpretation. The relationship between initial congruence of self-estimates and motivation category was then tested using the point biserial correlation coefficient. Separate correlations were computed for each grade level on achievement, intelligence, and interests.

Results

The results presented in Table XVII provide slight evidence for rejection of the null hypothesis. On the basis of these results it is concluded that the extent of agreement between actual and ideal self-estimates is unrelated to motivation for test interpretation in grades 5, 9, and 11. In grade 7, a positive relationship between agreement of actual and ideal self-estimates and motivation for test interpretation appears to exist for achievement tests. A negative relationship seems to exist for intelligence.

TABLE XVII

Relationship Between Actual and Ideal Self-Estimates and Motivation for Test Interpretation

Grade	Type of Test	rpb	Probability
5	Achievement	-.020	$>.05$
	Intelligence	-.059	$>.05$
	Interests	-.013	$>.05$
7	Achievement	.198*	$<.02$
	Intelligence	-.266*	$<.01$
	Interests	.085	$>.05$
9	Achievement	-.044	$>.05$
	Intelligence	.052	$>.05$
	Interests	-.055	$>.05$
11	Achievement	-.006	$>.05$
	Intelligence	-.149	$>.05$
	Interests	.035	$>.05$

Discussion

These results generally suggest that the extent of agreement between students' perceptions of their abilities and interests and their desired abilities and interests are unrelated to a desire for information about themselves. The results in grade 7, while far from conclusive, suggest the possibility for further study. If these correlation coefficients are accepted as truly representative of the population correlation coefficient, it could be concluded that students whose actual and ideal self-estimates of achievement are similar would be more prone to request test information about themselves, and that students whose actual and ideal self-estimates of intelligence are in agreement would be less prone to request information about themselves. This suggests that those seventh grade students who perceive a discrepancy between actual and ideal self-estimates are more likely to solicit intelligence test results.

Relationship of Initial Congruence Between Actual and Ideal Self-Estimates to Changes in Accuracy of Self-Estimates Following Test Interpretation

This analysis was conducted to determine whether the extent of initial agreement between students' actual and ideal self-estimates was related to changes in accuracy of self-estimates following test interpretation. The hypothesis was that no relationship existed between initial congruence of actual and ideal self-estimates and changes in accuracy of self-estimates following test interpretation. It was expected that this hypothesis would be rejected.

This hypothesis was tested by first determining the congruence between actual and ideal self-estimates on SR-1. The congruence scores were then correlated with the accuracy scores. The hypothesis of zero correlation was tested with a Pearson product-moment correlation coefficient.

It was necessary to compute correlation coefficients for achievement, intelligence, and interests for each grade level. Table XVIII presents these correlation coefficients.

Results

These correlation coefficients suggest no evidence of a relationship between initial agreement of actual and ideal self-estimates and changes in accuracy of self-estimates following test interpretation. The null hypothesis was accepted.

TABLE XVIII

Relationship of Initial Congruence Between Actual and Ideal Self-Estimates and Changes in Accuracy of Self-Estimates Following Test Interpretation

Grade	Type of Test	r	Probability
5	Achievement	.048	$>.05$
	Intelligence	.017	$>.05$
	Interests	.066	$>.05$

TABLE XVIII(continued)

Relationship of Initial Congruence Between Actual and Ideal Self-Estimates and Changes in Accuracy of Self-Estimates Following Test Interpretation

Grade	Type of Test	r	Probability
7	Achievement	-.065	>.05
	Intelligence	-.083	>.05
	Interests	-.022	>.05
9	Achievement	.056	>.05
	Intelligence	.054	>.05
	Interests	-.080	>.05
11	Achievement	.048	>.05
	Intelligence	-.003	>.05
	Interests	-.006	>.05

Discussion

From these results, one must conclude that the initial agreement between actual and ideal self-estimates is unrelated to changes in accuracy of self-estimates following test interpretation. It is possible, however, that students with self-estimates below ideal self-estimates may have shown high increases in accuracy, but students with self-estimates above ideal self-estimates may have refused to accept such information, thus obscuring an existing relationship. Perhaps, therefore, it would be appropriate in future research to examine the direction of errors in estimates.

CHAPTER VII

Summary, Conclusions, and Implications

Summary

The present study investigated the effects of pre-testing orientation upon (a) students' motivation for learning test results and (b) the changes in accurac of self-estimates resulting from test interpretation.

Five school systems were selected for participation in this study: two received the Orientation treatment, two the Routine treatment, and one was used to study the effects of communication about testing but was later combined with the larger sample when it was determined that a significant amount of communication between treatment groups had not occurred. One hundred students in grades five, seven, nine and approximately seventy students in grade eleven received the Orientation treatment prior to taking a battery of standardized achievement, inte ligence, and interest tests. An equal number of students in these same grades took the test battery without the Orientation treatment.

Pre-testing Orientation consisted of presenting students with a prepared statement about testing: what kinds of tests they would take, what uses could be made of tests, and what students could learn about themselves from the tests. Discussion was encouraged, and ample time was provided for questions.

Following Orientation, both treatment groups completed a self-rating instrument, took the test battery, and completed the self-rating device a second time. Students were then given an opportunity to request test interpretation interviews with trained counselors from the University of Illinois. Tests were interpreted first to students requesting interviews and last to those not requesting interviews. The self-rating device was completed a third time following the interview with the counselor.

The nineteen counselors who participated in this study were primarily post-masters and doctoral students enrolled in counseling and guidance at the University of Illinois and had, with two exceptions, completed a practicum in supervised counseling. In addition, these counselors were trained by the writer through role-playing interviews before they were permitted to interview students in the schools.

Findings

The data indicated that Orientation treatment resulted in greater motivation for learning test results within grades seven and nine (and almost within grade eleven), but not within grade five. There was no evidence of relationship between Orientation and changes in accuracy of self-estimates following test interpretation.

It was found that significant increases in accuracy of self-estimates occurr following test interpretation. This occurred for all grades and for the three types of tests interpreted.

While students make significant increases in accuracy of self-estimates following test interpretation, significant decreases occur during a two month period following test interpretation. In spite of these decreases, however, the accuracy of fourth self-estimates (follow-up) remains significantly higher than at the time of test administration.

Limited support was found for the hypothesis of relationship between motivation for test interpretation and changes in accuracy of self-estimates following test interpretation. In grade nine, requesting test interpretation was positivel related to changes in accuracy of self-estimates of achievement and interests. In grade eleven, this same relationship was found for changes in estimates of achievement. No significant relationship was found between motivation for test interpretation and initial accuracy of self-estimates of achievement, intelligenc or interests.

A positive relationship was found between measured intelligence and students' accuracy of self-estimates of achievement and intelligence. There are indication that intelligence is negatively related to students' ability to accurately estimate their interests.

Students' satisfaction with reported self-estimates increased over four self-rating occasions. This was observed for estimates of intelligence in grade seven, estimates of achievement and intelligence in grade nine, and for estimates of achievement, intelligence, and interests in grade eleven.

When given the opportunity to estimate the accuracy of their self-estimates made on successive occasions, students perceived these estimates to become increasingly more accurate. In spite of these perceptions, however, the estimated accuracy of self-ratings is unrelated to measured accuracy of self-estimates.

It appears that Orientation results in higher estimates of accuracy for the self-estimates made following test interpretation.

Initial agreement between actual and ideal self-estimates is apparently unrelated to motivation for test interpretation, except in grade seven where a positive relationship was found for achievement and a negative relationship for intelligence. No relationship exists between initial agreement, between actual and ideal self-estimates, and changes in accuracy of self-estimates following test interpretation.

Discussion

The data tentatively indicated a relationship between Orientation and motivation for test interpretation. If the limited time spent in this study on preparing students for testing resulted in greater motivation for learning about themselves through test interpretation, then this approach, as an explicit guidance function, should be given serious attention. This might enable some students to seek information about themselves who would have never initiated counseling contacts. As was clearly evident in this study, requests for test interpretation often represent a facade for many students seeking a "respectable" avenue to counseling.

The finding that Orientation treatment failed to result in increased accurac of self-estimates following test interpretation must be considered within the context of this study. Creating readiness for learning and integrating test information is probably an undertaking which cannot be accomplished in one class period. What was attempted during a short time in this study should be a continuing goal of school guidance programs. These negative findings should not be discounted, however. They suggest that the goal set for the Orientation treatment is a difficult one to accomplish, since the number of cases involved in this study is sufficiently large to have revealed even small existing relationships. A more realistic approach to this problem seems to be the provision of many guidance experiences designed to help students actively seek answers to questions about themselves.

The finding of a positive relationship between motivation for test interpretation and changes in accuracy of self-estimates following test interpretation was suggestive, but not conclusive. Logically, it would be assumed that among student requesting test interpretation would be many with specific questions about themselves for which test results might provide partial answers. If this were true, it would seem that students would remember and accurately report test information relating to the areas about which they had questions. It is surprising, therefore that this relationship was not observed at all grade levels and for intelligence test results. It is quite possible that "motivation for learning test results" represents other factors which could not be measured in this study.

It is evident from the results that students do not maintain the level of accuracy of self-estimates achieved through test interpretation. It appears, therefore, that continuous experiences should be provided to promote self-evaluation and/or to provide students with additional information about themselves. While the level of accuracy after a two-month follow-up period is higher than at the time of test administration, it cannot be determined how long these gains would be maintained. The decrease in accuracy noted in this study is characteristic of a learning curve, suggesting that true acceptance of test information has not occurred; however, learning is a necessary precondition for acceptance of test information, and these findings should be viewed as encouraging, especially when supplemented with intervening experiences as suggested above.

The data of this study strongly indicated that initial accuracy of self-estimates of abilities and interests is not a significant factor in determining whether students request test interpretation interviews. This finding lends support to the above suggestion that factors other than the desire to learn information about self may determine motivation for test interpretation. This does point out, however, that counselors cannot assume that students not requesting test interpretations have more accurate perceptions of their interests and abilities than those who request interviews.

In one instance grade level appeared to be positively related to accuracy of self-estimates following test interpretation. Of greater significance, it would seem, is the finding that significant increases in accuracy of self-estimates occurred at all grade levels for all types of tests interpreted.

These data, consistent with previous research, indicate that the more intelligent students are better able to estimate their measured achievement and intelligence scores. While few of the correlation coefficients obtained in this study are large enough to be of practical significance, with improved measurement techniques and the use of other relevant data, this finding might be useful to school counselors.

The finding that a significant amount of communication about testing did not take place in one school presents a limited basis for generalizing to a wide variety of school situations. Such factors as interest in learning about self, scheduling of classes, etc. might influence the extent to which this phenomenon would occur.

Students become increasingly satisfied with self-estimates over successive self-rating occasions. Contrary to the previous discussion, these results provide tentative evidence of acceptance of test information, that is, students become more prone to report liking the way they described themselves with each successive self-rating occasion. Furthermore, this relationship was absent for grade five, but became increasingly evident from grade seven through eleven, suggesting that maturity, as measured by grade level, may be a significant factor contributing to acceptance of test information.

Students believe that repeated self-estimates of achievement and intelligence become increasingly accurate. This is not true for self-estimates of interests, however, suggesting that students experience more difficulty in conceptualizing their interests, or, possibly that learning and understanding the meaning of eight or ten interest subtests is a bewildering task. While students' estimates of accuracy increase over occasions, as does measured accuracy, no relationship exists between estimated and measured self-estimates. Although apparently inconsistent, these results suggest that students are unable to accurately predict the accuracy of their self-ratings.

The slight evidence of a positive relationship between actual and ideal self-estimates of achievement suggests that students who believe the performance is consistent with their expectations are more likely to request test interpretation. The negative relationship for intelligence suggests that those who believe their measured intelligence is inconsistent with their desired intelligence are more prone to request test information about themselves. The finding of no relationship between actual and ideal self-estimates and changes following test interpretation is questioned, since students with estimates higher and lower than actual self-estimates may have responded differently to test information, thus possibly obscuring a true relationship. Future analyses should take account of the direction of differences between actual and ideal self-estimates.

Recommendations

The findings of this study support the formulation of recommendations for (1) improved guidance practice, (2) future research in the area of test interpretation, and (3) exploratory analyses of the data gathered during the course of the present study. It should be noted that the further analyses of these data are recommended only for descriptive and/or hypothesis-formulating investigations, since hypotheses generated by data cannot legitimately be tested with the same data.

1. Recommendations for Improved Practice

a. Since Orientation was not related to increased accuracy of self-estimates following test interpretations, it is recommended that a variety of planned experiences be provided by school guidance programs whereby students can have many opportunities to ask and find answers to questions about themselves.

b. The finding that students at grades five and seven increased the accuracy of their self-estimates following test interpretation suggests that the approach to test interpretation used in this study could profitably be extended lower into the junior high school and elementary school grades than is presently the case.

c. Since Orientation was apparently related to greater motivation for test interpretation, this approach to testing should be given consideration.

d. Counselors should not assume that students not requesting test information possess more accurate perceptions of their interests and abilities than those who seek such information.

e. Counselors should attempt to elicit and respond appropriately to the affect expressed by students during test interpretation.

f. Counselors should systematically provide experiences designed to promote self-evaluation and/or provide students with additional information about themselves following test interpretation.

2. Recommendations for Future Research

a. The operational definition of motivation for test interpretation used in this study should be expanded and modified through a systematic investigation of the factors contributing to requests for test information.

b. Future research should attempt to differentiate between recall and acceptance of test information.

c. The criterion of test interpretation employed in this study was self-report data. Future research should begin to examine long and short range changes in the external behavior of students who participate in systematic test interpretation interviews with qualified counselors.

d. Research should be designed to determine the optimum length and/or number of interviews required to accomplish the goals of test interpretation most effectively.

3. Recommendations for Exploratory Analyses of these Data

a. Analyses could be made examining the variation among counselors with respect to accuracy of students' self-estimates following test interpretation.

b. Analyses could be made comparing students from various occupational classifications with respect to motivation for test interpretation, initial accuracy of self-estimates, and/or accuracy of self-estimates following test interpretation.

c. Analyses could be undertaken to determine whether there are any factors which differentiate students with most and least accurate self-estimates.

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ORIENTATION PROCEDURE

GRADES 5 AND 7

Tomorrow you will be taking three tests like those commonly given in schools. Before you take the tests, I would like to spend some time today talking with you about why the tests are being given, describing them, and discussing what you can learn about yourself and what your teachers and counselors can learn about you from such tests.

I want all of you to feel free to ask any questions you may have about these tests or other tests you might have taken which were like them. None of these tests are the kind you take for your school subjects, and the scores you make on these tests will not affect your school grades.

What Kinds of Tests Will You Be Taking?

The first test is called an achievement test. It measures how well you understand and are able to use the main ideas covered in your school subjects, compared to other pupils of your own age. It will contain questions about social studies, science, arithmetic, and some questions on reading and on your ability to use books and dictionaries to find answers to your questions. Each of the sections on this test is timed, so you should work as rapidly as you can without being careless about your answers. You should not be worried if you don't finish all of the questions. Many of you won't get finished with every part of the test, but you should all have enough time to answer all of the questions for which you know the answers. When you start the achievement test you should first read through, answering all of the questions of which you are sure of the answers. Then, in the time left, go back and finish the other ones. PLEASE STOP ME ANY TIME YOU HAVE A QUESTION OR WHEN I HAVE SAID SOMETHING THAT IS NOT CLEAR TO YOU.

APPENDIX A

ORIENTATION PROCEDURE

GRADES 5 AND 7

The second test is a test of learning ability. It tells how easily you are able to solve problems in everyday life and to learn from books, compared to others of your own age. There will be 90 questions in 30 minutes. You should work as rapidly as possible, but be careful enough to avoid careless mistakes such as marking the answer for question 89 in the answer space for question 90. All of you will not finish the test, but you will have time to do all of the questions for which you know the answers. When you begin the learning ability test you should first read through the test, answering the questions you are sure of. Then, in the time you have left, go back and do the other ones. The test will cover a lot of different types of questions including the meanings of words, arithmetic, completion of sentences and unscrambling letters to make words. (Pause briefly) BE SURE TO STOP ME WHEN YOU HAVE QUESTIONS.

The third test to be given is one to measure your interests. Most of you know fairly well the things which interest you, that is, the things you like to do. This test will ask you to check how much you like certain activities. A number of things to do will be listed, and you will be asked to mark the things you would most like to do and the things you would least like to do. It will compare your answers to those of a great many students of your own age, and it will show how your interests compare to theirs. There will be no time limit on this test. You may take as much time as you need to finish, but you should answer without thinking very long about your answers. There will be no "right" or "wrong" answers on this test. You have to decide which answers are right for you.

What Can Be Learned From Tests?

In general, tests tell you things about yourselves which most of you already know. Most of you know what things you like to do, know how well you do in school, and have some idea of how easily you learn. Tests, however, often also tell some things that you didn't know about yourselves. Pupils often discover, for example, that they are interested in some things that they hadn't thought much about. Others discover that they have learned more in school than either they or their teachers realized. Still others may learn from tests that they have certain weaknesses to correct in certain subjects, and some may find out that they don't learn as easily as most other pupils their age, and this may explain to them why they have been having difficulty with certain kinds of school work. Some pupils find that they are able to learn more easily than they or their teachers had thought. They may find out from this that they are able to learn more in certain subjects than they thought they could.

Finally, tests show you how much you are like pupils your own age; for example, whether you like science more or less than most others of your own age, whether you understand and can use arithmetic as well as others of your own age, or how easily you learn in comparison with others of your own age.

What Can You Do With Information From Tests?

1. Achievement--Knowing how well you have learned the important ideas taught in your school subjects over the past years will help you to understand your strengths and weaknesses. Such test scores show whether you are learning equally well in all areas and point out the areas you are not doing as well in, if any. Such scores often give you a picture of yourselves which is somewhat different from the grades you get in school. You may find that you know more, or less, in certain subjects than your grades really show. Knowing more about what you can do best is helpful in choosing after-school activities, deciding what kinds of hobbies you might like, and later in choosing courses in high school. Learning about the weak spots in your school work may help you discover where you need

special help from your teacher or parents or where you might need to work harder.

2. Learning Ability--Knowing how easily you learn is helpful in giving you a more complete picture of yourselves. It often tells you why certain subjects in school are hard for you, or why you are not interested in certain subjects.

3. Interests--Knowledge of your interest scores may start you thinking about activities that you might enjoy but have never tried. For example, one boy's interest test suggested that he was interested in working with machines and tools and in making things with his hands. He had liked these things for a long time, but he had never really done much with tools and machines. When he learned about his test scores, he decided to do more things involving tools, so he began tinkering in his father's garage workshop. He enjoyed that kind of thing so much that he took several shop courses in high school. All of you are interested in pretty much the same kinds of things, but you differ a lot in how much you like such activities as quiet play, active play, reading, outdoor activities, etc. Interest tests try to show how much you like these variohs activities so it is possible for you to compare your liking for two or more activities. A more complete understanding of your interests can be helpful in choosing your free time activities wisely. One girl, for example, spent a summer camping and w as unhappy the whole time. The following year her interest test scores showed that she did not enjoy outdoor activities. This information did not surprise her, but had she known about it earlier, she might have thought more about what camping would really be like and whether this was something she would enjoy. In addition to helping you decide on hobbies you would like to try, or whether, for example, you want to spend more of your out-of-school time on camping or music, interest tests may suggest topics which you might like to read more about, projects you might like to do, or ways in which teachers can help you enjoy your school work more by helping you find things you enjoy.

What (other) questions do you have at this time? (Wait for questions, then proceed.)

You have probably asked yourselves the question, "How do I compare with others of my own age?" This study is being carried out to try to find out how well (5th or 7th graders) like yourselves are able to compare themselves with others of their own age on the abilities and interests which we have just been talking about, These will be described in a Self-Rating Scale that will be passed out. (Proceed with directions on the rating scale.)

APPENDIX B

ORIENTATION PROCEDURE

GRADES 9 AND 11

ORIENTATION PROCEDURE

GRADES 9 AND 11

I know that you have all taken a lot of tests in school. Most of them have been made up by your teachers in order to see how well you have learned the subjects you have been studying. However, other tests you have taken are of the kind made up by people outside of the school in order to help you, your teachers, counselors and parents understand more about you as a person, your abilities, achievements and interests.

I am going to give you three tests which are of this last type. However, before you take them, I would like to spend some time with you talking about why the tests are being given, what the tests are like, and most of all, discussing what you, your counselors and teachers can learn about you as an individual from these tests. This is what I hope you'll remember as we continue our discussion-- the whole purpose of tests of this sort is to gather information which can be useful to you and those persons concerned about your development as an individual.

Toward the end of this period, I will give you a checklist on which you will find the three tests described quite fully. This checklist will ask you to indicate how interested you are in such things as science, outdoor activities, etc. This rating sheet will also ask you to indicate how well you feel you have mastered the main ideas taught in your school subjects and how easily you feel you are able to solve new problems in and out of school.

Now to get back to our discussion of the tests. Please feel free to ask any questions that occur to you as we go along. None of these tests is the kind that you take for school subjects, so let me reassure you that the results will have absolutely no effect on your school grades.

Perhaps I can best tell you about these tests by answering the following questions:

1) What kinds of tests will you be taking?

2) What can be learned from these tests?

3) What can you do with information from these tests; that is, how can this information be useful?

PLEASE FEEL FREE TO STOP ME ANY TIME YOU HAVE QUESTIONS, OR WHEN I HAVE SAID SOMETHING THAT IS NOT CLEAR TO YOU.

1) What Kinds of Tests Will You be Taking?

The first test you will take is an achievement test. When we say that a person has achieved something we mean he has accomplished or done that thing. Thus an academic achievement test seeks to measure what you have accomplished in your school subjects, or, to put it another way, how effectively you have understood your work in these subjects. There will be questions about social studies, mathematics, and the sciences. Also, it will test your accomplishment in reading and your ability to understand the main ideas in a piece of writing. This achievement test will deal mainly with the broad, general ideas presented in your school subjects rather than a large number of specific facts.

Your scores on this achievement test will give you some idea of how well you have learned the main ideas covered in your courses. The test also will give you some indication of how well you have "achieved" in comparison to other persons your own age. (Watch for signs of questions, such as puzzled expressions, students hesitating - about to raise hands, etc.)

Each section of this test is timed, so you should work as rapidly as you can without being careless about your answers. You should not be worried if you don't finish all of the questions. Not many of you will finish every part of this achievement test, but you should all have time to answer all of the questions for which you know the answers. Let me suggest that you first go through the complete test, answering those questions that you are sure of, then, in the time remaining, go back and answer as many of the remaining questions as you can.

The second test you will take is called a test of learning ability. The achievement test seeks to measure what you have learned, the learning ability test seeks to find out how well you can learn. Thus, when we talk about learning ability we mean the extent to which a person is able to solve problems in everyday life and learn from books.

There will be 90 questions on this test. You will have 30 minutes to complete it. Most of you will not finish the test, but you will all have time to answer the questions for which you do know the answers. You should go through the test answering those questions you are sure of, then go back and spend the remaining time on those questions which are more difficult for you.

The third test to be given is one to measure your interests. Most of you know, in some general way, the things which interest you, that is, the things which you enjoy doing. This test will ask you to indicate how much you like certain activities. From your answers to the questions on this test it will be possible to get some general picture of your interests. From this you will be able to tell how your interests compare to those of other people your own age, or how interested you might be in some things which you have never had a chance to try.

There will be no time limit on this test. You may take as much time as you need to complete it, but it has been found that most people give a truer picture of their interests when they answer the questions without thinking too long about them. There are no "right" or "wrong" answers to these questions; however, there are answers which are "right" for you, and it is these answers which you should mark. Some students are tempted to answer these questions as they think someone they admire would answer them. If the test results are to describe you accurately, you must answer these questions in terms of how you feel.

2) What Can Be Learned From These Tests?

In general, tests tell you things about yourselves which you may already have some general idea of, but which you have never thought a great deal about. For example, you might have a general idea that you can read pretty well, but you might not know exactly how well you read in comparison to other people your age all over the country. Tests often tell you some things about yourselves that you don't know. Students often discover, for example, that they are interested in certain things that they hadn't thought about. Other people discover from the tests that they have learned more in school than either they or their teachers had realized. Tests may also point out some weaknesses which may have been causing you difficulty in certain of your school subjects. Knowing your weaknesses, you can start getting the kind of ehlp from your teachers or parents which you need to improve your work in certain courses.

Some students may find out that they don't learn as easily as most other students their own age, and this may explain to them why they have been having difficulty with certain kinds of school work, or why they have to spend a lot more time understanding things that some of their friends seem to learn quite rapidly. On the other hand, some students find that they are able to learn more easily than they or their teachers had thought. They may realize from this that they are able to get more meaning out of certain courses than they have been getting.

3) How Can Information Obtained From Tests Be Useful to You?

a. Achievement tests indicate how well you have learned the basic ideas taught in your school subjects over the past years. They tell you what areas you are strongest and weakest in and how your strengths and weaknesses compare to those of other people your own age. For example, language skills may be your weakest area; however, your ability in this area may still be above that of most students your age. The results of achievement tests may give you a picture of yourself which is somewhat different from that presented by your school grades. You may find that you have achieved more or less in certain areas than your grades actually show.

Knowing more about what you can do best is helpful in choosing extra-curricular and out-of-school activities, choosing hobbies, courses in school, and even deciding what you are going to do after graduation from high school.

b. Interest test results may start you thinking about some activities that you might enjoy, but have never tried. For example, one boy knew that he enjoyed hunting, camping and working outside. However, he hadn't realized that all of these activities have in common the fact that they take place in the out-of-doors. His interest test indicated a high interest in "outdoor" activites. After thinking about some of the things which outdoor activities included, he began wondering about working as a fish and wildlife conservation agent or forst ranger after he finished school. The high "outdoor" interest score did not mean at all that he had the ability to do those things, but it did mean that if he had the ability to do such work, he would probably like it.

All of you are interested in many of the same things, but you differ in how much you like these activities. To some extent we all like sports, but certainly each of us differs in how much he likes them. Interest tests try to show how much you like various activities, thus making it possible for you to compare your interest in two or more activities.

This test may also help you identify occupations which you would enjoy. If, for example, you had decided to become an engineer, and your ability tests showed that you had the ability to do so, your interest test scores might help you decide whether you should become a civil engineer, who works out-of-doors, or an electrical engineer, whose work keeps him mainly inside. Or if you had decided to enter the area of home economics your interest scores might indicate whether you would be happier as a home economics teacher or an extension agent.

Interest tests may help you decide on hobbies you would like to try. Such tests might suggest topics you might like to read about, projects you might start, or ways in which your teachers can help make your school work more meaningful by helping you find problems and projects which will allow you to use the things you learn in the classroom.

What (other) questions do you have at this time? (Wait for questions, then proceed.)

You have probably asked yourselves the question, "How do I compare with others of my own age?" This study is being carried out to try to find out how well (9,11--th graders - read appropriate grade for group being oriented) like yourselves are able to compare themselves with others of their own age on the abilities and interests which we have just been talking about. These will be described in a Self-Rating Scale that will be passed out. (Proceed with directions on the rating scale.)

APPENDIX C

PUPIL SELF-RATING SCALE

GRADES 5 AND 7

PUPIL SELF-RATING SCALE

GRADES 5 AND 7

School______________ Name______________

Grade______________ Date______________

DIRECTIONS:

Everyone has some idea about how much he is like other people his own age. Now you are asked to think about your interests, how easily you learn, and how much you have learned in your school subjects. Try to tell how you think you compare with most others your own age. Try to answer each question as you believe you are at this time. It is important that you be honest with yourself and describe yourself as you believe you are in comparison with most others your own age. If you are not sure, give the most nearly correct answer you can.

As you answer each question you are asked to tell how you feel about the way you have described yourself and how you wish you really were.

No persons except the ones giving this scale will see how you have answered the questions about yourself. Remember, try to answer as you honestly feel you are and not as your friends or teachers say you are.

After reading each of the following questions, print an "X" before the words which best describe you.

GO ON TO NEXT PAGE

EXAMPLE I -- Here is the way one pupil checked a question:

Compared with others your own age, how much do you enjoy reading mystery stories?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
(x) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like no dislike being this way
(x) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
(x) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

Even though this pupil liked mystery stories, he marked the first question this way because he didn't believe he liked mystery stories quite as much as most others his age. He checked the second question as he did because he didn't like feeling this way about mystery stories. He checked the last question as he did because he really wished he liked mystery stories a little bit more than most others his age.

EXAMPLE II -- Here is the way another pupil marked the same question:

Compared with others your own age, how much do you enjoy reading mystery stories?

( ) Very much more than most pupils my age
(x) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
(x) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

how would you really like to be?

( ) Very much more than most pupils my age
(x) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

Even though this pupil wasn't crazy about mystery stories, he marked the first question this way because he felt he liked mystery stories somewhat more than most others his age. Because he didn't care much one way or the other about how he felt, he checked that he neither liked nor disliked feeling this way about mystery stories. He checked the third question just like he did the first because he did not wish to like mystery stories any more than he already does.

I. Achievement

1. Compared with others your own age, how well do you understand the meanings of words you read and the words others speak? For example, how well do you understand and use most of the words you find in your textbooks? How easily do you understand the words your friends and teachers use and the words you hear on T.V. and radio?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

2. Compared with others your own age, how well do you understand what you read?

For example, how able are you to get the meaning out of the things you read?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

3. Compared with others your own age, how well are you able to spell, use capital letters, punctuation marks, and use words correctly in sentences?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

GO ON TO NEXT PAGE

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

4. Compared with others your own age, how good are your work and study skills? For example, how well do you read and get meaning from maps, graphs, and tables, and how well do you use such reference books as dictionaries and encyclopedias?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

5. Compared with others your own age, how well do you understand the ideas in arithmetic, and how easily do you solve arithmetic problems? For example, how well have you mastered the main arithmetic skills such as addition, substraction, multiplication, and how well are you able to use these skills in solving arithmeti problems in school and out of school?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

II. Learning Ability

Compared with others your age, how easily are you able to learn from books and understand ideas that are written or spoken by others? For example: How good are you at figuring things out? How good are you at solving puzzles or figuring out how a machine works? How easily can you get across to others in writing and speaking what you are thinking? How easily can you figure out what others are trying to tell you?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

GO ON TO NEXT PAGE

III. Interests

1. Compared with others your own age, how much do you like art -- painting, drawing, working with modeling clay, soap-carving, etc?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

2. Compared with others your own age, how much do you like playing records, listening to musical programs and watching them on T. V., going to musical movies and musical concerts and programs?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

GO ON TO NEXT PAGE

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

3. Compared with others your own age, how much do you like learning about how people live in other countries, about how people lived in the past, and about the geography of our world?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I like very much being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

4. Compared with others your own age, how much do you like to take part in active play -- baseball, basketball, hopscotch, running, jumping, swimming, etc.?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

GO ON TO NEXT PAGE

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

5. Compared with others your own age, how much do you like quiet play -- checkers, playing cards, telling stories, playing guessing games, taking walks, etc.?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

6. Compared with others your own age, how much do you like working with your hands and making things from materials, such as building models, wood-carving, etc.?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

7. Compared with others your own age, how much do you like doing things around your house, such as doing household chores, helping your mother in the kitchen, helping your father around the yard and garage?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

8. Compared with others your own age, how much do you like activities where you try to find answers to scientific questions? For example: Why does that plant grow that way? What will happen when I mix these chemicals, and why does it happen? Where does electricity come from? What causes tornadoes?

GO ON TO NEXT PAGE

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most pupils my age
( ) Somewhat more than most pupils my age
( ) About the same as most pupils my age
( ) Somewhat less than most pupils my age
( ) Very much less than most pupils my age

GO ON TO NEXT PAGE

Directions:

Place an "X" in the spaces below which describe how accurately you believe you have described yourself in the areas of achievement, learning ability, and interests.

1. Compared with others of your own age, how sure are you about how much you have learned in your school subjects?

__1. I know almost exactly how I compare with others.
__2. I know pretty well how I compare with others.
__3. I have a fair idea of how I compare with others.
__4. I am not very sure how I compare with others.
__5. I really don't have any idea about how I compare with others.

2. Compared with others of your own age, how sure are you about how easily you learn?

__1. I know almost exactly how I compare with others.
__2. I know pretty well how I compare with others.
__3. I have a fair idea of how I compare with others.
__4. I am not very sure how I compare with others.
__5. I really don't have any idea about how I compare with others.

3. Compared with others of your own age, how sure are you about what you like to do best?

__1. I know almost exactly how I compare with others.
__2. I know pretty well how I compare with others.
__3. I have a fair idea of how I compare with others.
__4. I am not very sure how I compare with others.
__5. I really don't have any idea about how I compare with others.

ANSWER SHEET FOR SELF-RATING SCALE
GRADES 5 AND 7

School________________ Name______________________

Grade________________ Teacher's Name______________ Date______________________

EXAMPLE I.	EXAMPLE II.	I. Achievement					II. Learning Ability
		1.	2.	3.	4.	5.	
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )

III. Interests

1.	2.	3.	4.	5.	6.	7.	8.
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )

IV. How accurately you believe you have described yourself

1.	2.	3.
( )	( )	( )
( )	( )	( )
( )	( )	( )
( )	( )	( )
( )	( )	( )

APPENDIX D

STUDENT SELF-RATING SCALE

GRADES 9 AND 11

STUDENT SELF-RATING SCALE

GRADES 9 AND 11

School____________________ Name____________________

Grade____________________ Date____________________

DIRECTIONS:

Everyone has some picture of himself as to how much he is like other people his own age. Now you are asked to compare yourself with others of your own age in terms of some of your interests, how easily you learn, and how much you have learned from your school subjects. Try to tell how you believe you compare with others your own age. Try to answer the questions as you believe you compare with others your own age. Try to answer the questions as you believe you are at this time. It is important that you be honest with yourself and describe yourself as you believe you are in comparison with others. If you are not sure how you compare with others, give the most accurate answer you can.

As you answer each question you are asked to tell how you feel about the way you have described yourself and how you wish you actually were.

No persons except those giving this scale will see how you have answered these questions about yourself. Remember, try to answer as you feel you are and not as your friends or teachers say you are.

After reading each of the following questions, print an "X" before the words which best describe you.

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EXAMPLE I -- Here is the way one student checked a question:

Compared with others your own age, how much do you enjoy reading mystery stories?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
(X) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
(X) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
(X) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

Even though this person enjoys mystery stories, he marked the first question this way because he didn't believe he liked reading mystery stories quite as much as most others his age. He checked the second question as he did because he didn't like feeling that way about mystery stories, and he checked the last question as he did because he really wished he liked reading mystery stories a little bit more than most others his age.

EXAMPLE II -- Here is the way another student marked the same question:

Compared with others your own age, how much do you enjoy reading mystery stories?

( ) Very much more than most students my age
(X) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
(X) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
(X) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

Even though this person wasn't crazy about mystery stories, he marked the first question this way because he felt he liked reading mystery stories somewhat more than most others his age. Because he didn't care much one way or the other about how he felt, he checked that he neither liked nor disliked feeling this way about mystery stories. He checked the third question as he did because he did not wish to like reading mystery stories any more than he already does.

I. Achievement

1. Compared with others your own age, how well do you understand the important ideas and concepts in history, geography, economics, and civics? For example, how well do you understand such concepts as democracy, trial by jury, imigration, and taxation?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
½ ( ) I dislike being this way
( ) I very much dislike being this way

GO ON TO NEXT PAGE

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

2. Compared with others your own age, how well do you understand scientific principles and the important part that science plays in the world today? For example, how well do you understand such concepts as the solar system, expansion of gases, magnetism, force of gravity, jet propulsion, etc.?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

3. Compared with others your own age, how well are you able to express your ideas correctly in writing? For example, how well do you use the proper words in writing your ideas and how well do you organize your ideas so they make sense to others who read them?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

4. Compared with others your own age, how well are you able to use arithmetic and mathematical principles in the solution of practical problems? For example, how well can you figure the cost of gasoline needed for a vacation trip, find the area of a field, find the cost of items sold at a discount, work problems involving unknown numbers?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

5. Compared with others your own age, how well do you understand the meanings of words you read and hear spoken by others? For example, how well do you understand the words your friends and teachers use and the words you hear used on T.V. and radio? How well do you understand the words you find in your textbooks, newspapers, and magazines?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

II. Learning Ability

Compared with others your own age, how easily are you able to learn from books and understand ideas that are written or spoken by others? For example: How good are you at figuring things out? How good are you at solving puzzles or figuring out how a machine works? How easily can you get across to others in writing and speaking what you are thinking? How easily can you figure out what others are trying to tell you?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

III. Interests

1. Compared with others your own age, how much do you like outdoor activities? For example, hiking, working with living and growing things, and looking at trees, rocks, and plants.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

2. Compared with others of your own age, how much do you like activities in which you work with tools and machines? For example, tinkering with and repairing mechanical objects, operating machinery.

GO ON TO NEXT PAGE

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

3. Compared with others your own age, how much do you like activities in which you work with numbers? For example, having the duties of a club treasurer and keeping track of accounts--in other words, activities similar to those you do in arithmetic.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

4. Compared with others your own age, how much do you like activities where you attempt to find the answers to scientific questions? For example: why does that plant grow in that particular way? What will happen if I mix these chemicals together? Why will it happen? How do we get power from electricity?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

5. Compared with others your own age, how much do you like activities where you try to get other people to agree with your ideas? For example, planning and directing projects, working as a salesman, taking part in a debate--in other words, getting people to see things your way.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this
( ) I very much dislike being this way

GO ON TO NEXT PAGE

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

6. Compared with others your own age, how much do you like activities that involve making and creating things with your hands? For example: drawing, designing, painting, coloring, sculpturing, sketching, and decorating.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

7. Compared with others your own age, how much do you like activities that involve reading good books and writing? For example: writing stories and reports, reading and analyzing what others have written, writing stories and articles for the school newspaper.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

8. Compared with others your own age, how much do you like activities involving music? For example: listening to records, attending concerts and other musical programs, reading about music and musicians, playing in an orchestra or band, singing in musical groups, or just singing or playing a musical instrument for your own enjoyment.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

GO ON TO NEXT PAGE

9. Compared with others your own age, how much do you like activities where you help people? For example: helping another student with his lessons, visiting a sick friend, doing things around home and running errands for your family, working at a playground with smaller children or helping them with their problems.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

How would you really like to be?

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

10. Compared with others your own age, how much do you like activities like those which people in offices do? For example: keeping accurate and precise records, putting things away in their correct places, working with details.

( ) Very much more than most students my age
( ) Somewhat more than most students my age
( ) About the same as most students my age
( ) Somewhat less than most students my age
( ) Very much less than most students my age

How do you feel about being this way?

( ) I very much like being this way
( ) I like being this way
( ) I neither like nor dislike being this way
( ) I dislike being this way
( ) I very much dislike being this way

GO ON TO NEXT PAGE

How would you really like to be?

- ( ) Very much more than most students my age
- ( ) Somewhat more than most students my age
- ( ) About the same as most students my age
- ( ) Somewhat less than most students my age
- ( ) Very much less than most students my age

GO ON TO NEXT PAGE

Directions:

Place an "X" in the spaces below which describe how accurately you believe you have described yourself on the areas of achievement, learning ability, and interests.

1. Compared with others of your age, how sure are you about how much you have learned in your school subjects?

___1. I know almost exactly how I compare with others.
___2. I know pretty well how I compare with others.
___3. I have a fair idea of how I compare with others.
___4. I am not very sure how I compare with others.
___5. I really don't have any idea about how I compare.

2. Compared with others of your age, how sure are you about how easily you learn?

___1. I know almost exactly how I compare with others.
___2. I know pretty well how I compare with others.
___3. I have a fair idea of how I compare with others.
___4. I am not very sure how I compare with others.
___5. I really don't have any idea about how I compare.

3, Compared with others of your age, how sure are you about what you like to do best?

___1. I know almost exactly how I compare with others.
___2. I know pretty well how I compare with others.
___3. I have a fair idea of how I compare with others.
___4. I am not very sure how I compare with others.
___5. I really don't have any idea about how I compare.

ANSWER SHEET FOR SELF-RATING SCALE
GRADES 9 AND 11

School________________ Name____________________

Grade________________ Teacher's Name________________ Date____________________

EXAMPLE I.	EXAMPLE II.	I. Achievement					II. Learning Ability
		1.	2.	3.	4.	5.	
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )

III. Interests

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
( )	( )	( )	( )	( )	( )	( )	( )	( )	( )

IV. How accurately you believe you have described yourself.

1.	2.	3.
( )	( )	( )
( )	( )	( )
( )	( )	( )
( )	( )	( )
( )	( )	( )

APPENDIX E

INFORMATION SHEET

INFORMATION SHEET

Student's Name______________________________

School______________________________
Grade______________

1. Father's or Guardian's Name______________________________

2. Mother's Name______________________________

3. Occupation of Father or Guardian______________________________

Employer______________________________

4. Highest grade completed in school by your Father (or Guardian)
Circle one:

6 7 8 9 10 11 12 13 14 15 16 G*

5. Highest grade completed in school by your Mother
Circle one:

6 7 8 9 10 11 12 13 14 15 16 G*

6. Father living? Yes____ No_____ (check one)

7. Mother living? Yes____ No_____ (check one)

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*College work beyond the Bachelor's Degree

APPENDIX F

COUNSELING REQUEST FORM

COUNSELING REQUEST FORM

School____________________ Name________________________

Teacher's Name____________ Grade________________________

Place an "X" before one of the following choices:

___1. I would like to talk about my test results with a counselor to learn more about myself.

___2. I am not sure at this time whether I want to talk about my test results with a counselor to learn more about myself. I will decide about this in a few days.

___3. I would rather not talk about my test results with a counselor to learn more about myself.

APPENDIX G

TEST INTERPRETATION INTERVIEW FORM

GRADES 5 AND 7

Test Interpretation Interview Form
Grades 5 and 7

Counselor____________________ Student's Name____________________

School____________________ Date____________________

I. Achievement

	Did very poorly	Didn't do as well as most	Did as well as most	Did better than most	Did very well
1. Vocabulary					
2. Reading					
3. Language					
4. Work-Study Skills					
5. Arithmetic					

II. Learning Ability

It's very difficult	It's difficult	Learn as easily as most	It's easy	It's very easy

III. Interests

	Like it a lot less	Like it less	Like it as well as most	Like it more	Like it a lot more
1. Art					
2. Music					
3. Social Studies					
4. Active Play					
5. Quiet Play					
6. Manual Arts					
7. Home Arts					
8. Science					

Counselor Comments:

Non-test data which supplements test scores
Affective reactions to information
Client wanted further session(s)
Other observations

APPENDIX H

TEST INTERPRETATION INTERVIEW FORM

GRADES 9 AND 11

Test Interpretation Interview Form
Grades 9 and 11

Counselor__________________ Student's Name__________________

School____________________ Date________________

I. Achievement

	Did very poorly	Didn't do as well as most	Did as well as most	Did better than most	Did very well
1. Understanding of Basic Social Concepts					
2. Background in the Natural Sciences					
3. Correctness and Appropriateness of Expression					
4. Ability to do Quantitative Thinking					
5. General Vocabulary					

II. Learning Ability

It's very difficult	It's difficult	Learn as easily as most	It's easy	It's very easy

III. Interests

	Like it a lot less	Like it less	Like it as well as most	Like it more	Like it a lot more
1. Outdoor					
2. Mechanical					
3. Computational					
4. Scientific					
5. Persuasive					
6. Artistic					
7. Literary					
8. Musical					
9. Social Service					
10. Clerical					

Counselor Comments:

- Non-test data which supplemented test scores
- Affective reaction to information
- Client wanted further session(s)
- Other observations